97-84013-11

Atlantic Deeper
Waterways Association

The Atlantic Intra-Coastal Waterway

[Philadelphia]

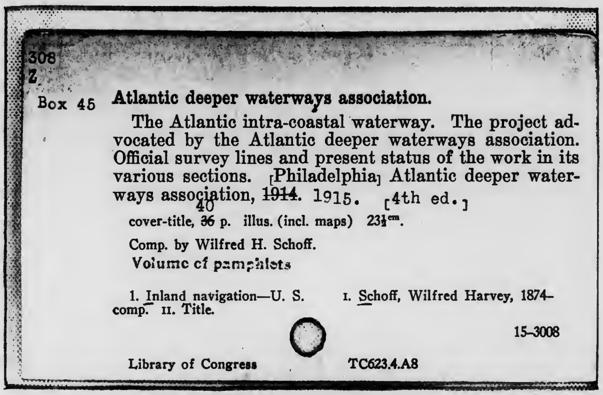
1915

97-84013-11
MASTER NEGATIVE #

COLUMBIA UNIVERSITY LIBRARIES
PRESERVATION DIVISION

BIBLIOGRAPHIC MICROFORM TARGET

ORIGINAL MATERIAL AS FILMED - EXISTING BIBLIOGRAPHIC RECORD



308
Z
Box 45 **Atlantic deeper waterways association.**

The Atlantic intra-coastal waterway. The project advocated by the Atlantic deeper waterways association. Official survey lines and present status of the work in its various sections. [Philadelphia] Atlantic deeper waterways association, ~~1914~~. 1915. [4th ed.]

cover-title, 40 ~~36~~ p. illus. (incl. maps) 23½ cm.

Comp. by Wilfred H. Schoff.

Volume of pamphlets

1. Inland navigation—U. S. I. Schoff, Wilfred Harvey, 1874– comp. II. Title.

15-3008

Library of Congress TC623.4.A8

RESTRICTIONS ON USE: *Reproductions may not be made without permission from Columbia University Libraries.*

TECHNICAL MICROFORM DATA

FILM SIZE: 35 mm REDUCTION RATIO: 11:1 IMAGE PLACEMENT: IA [✓ IIA] IB IIB

DATE FILMED: 2-5-97 INITIALS: ms.

TRACKING # : MSH 20992

FILMED BY PRESERVATION RESOURCES, BETHLEHEM, PA.

INTENTIONAL
SECOND
EXPOSURES DUE TO
PHOTOGRAPHS

THE
ATLANTIC INTRA-COASTAL WATERWAY

THE PROJECT ADVOCATED
BY
THE ATLANTIC
DEEPER WATERWAYS ASSOCIATION

OFFICIAL SURVEY LINES
AND
PRESENT STATUS OF THE WORK
IN ITS
VARIOUS SECTIONS

3c
2
[illegible] 45

PUBLISHED BY
THE ATLANTIC DEEPER WATERWAYS ASSOCIATION
1915

ATLANTIC
DEEPER WATERWAYS ASSOCIATION

815 CROZER BUILDING, PHILADELPHIA

GENERAL BOARD OF DIRECTORS

President

J. HAMPTON MOORE	Pennsylvania

Vice-Presidents

MAURICE RICH	Maine
O. L. FRISBEE,	New Hampshire
FREDERICK H. BABBITT	Vermont
FRANK FESSENDEN CRANE	Massachusetts
FRED. F. HALLIDAY, JR.	Rhode Island
ROLLIN S. WOODRUFF	Connecticut
——— ———	New York
FREDERICK W. DONNELLY	New Jersey
J. S. W. HOLTON	Pennsylvania
HIRAM R. BURTON	Delaware
JOSEPH C. WHITNEY	Maryland
GEORGE AINSLIE	Virginia
JOHN D. BIGGS	North Carolina
W. D. PORCHER	South Carolina
RICHARD J. DAVANT	Georgia
W. A. BOURS	Florida

Delegates

PERCY S. ACKERMAN	Maine
W. H. JAQUES	New Hampshire
FRANK E. HOWE	Vermont
JAMES E. LEWIS	Massachusetts
MICHAEL MOY,	Rhode Island
THEODORE BODENWEIN	Connecticut
EDW. F. MURRAY,	New York
H. R. KINGSLEY	New Jersey
EUGENE W. FRY	Pennsylvania
WILLIAM H. HEALD	Delaware
——— ———	Maryland
T. M. CARRINGTON	Virginia
A. T. BAKER	North Carolina
W. D. MORGAN	South Carolina
W. W. WILLIAMSON	Georgia
HARRY GOLDSTEIN	Florida

Secretary-Treasurer

WILFRED H. SCHOFF	Pennsylvania

Assistant Secretary

DURELL SHUSTER	Pennsylvania

COMPILED BY WILFRED H. SCHOFF
First edition, September, 1912; Second edition, February, 1914; Third edition, revised and enlarged, December, 1914; Fourth edition, September, 1915.

THE ATLANTIC INTRA-COASTAL WATERWAY

FOREWORD

THE Atlantic Deeper Waterways Association was organized in 1907 to promote the construction of a series of canals linking the natural bays and sounds along the Atlantic seaboard, in order to provide a modern protected free waterway, admitting heavy traffic, owned and operated by the United States government, between New England and Florida.

Pursuant to resolutions adopted by this Association, surveys along the entire route proposed were authorized by various acts of Congress, and these surveys have now been completed by the United States Army Engineer Corps and their recommendations with full details and plans of the surveys in the various sections are now in printed form for consideration by Congress.

Broadly speaking, the Army Engineers have reported favorably on the greater part of the project and have recommended immediate action on several of the links, and early future action on a number of those remaining.

These reports, with full details, have now been printed as government documents and may now be obtained under the following numbers:

Northern section, Boston, Mass., to Beaufort, N. C. 62d Congress, Second Session, Document 391; also 63d Congress, First Session, Document 196.

Improvements in New York Harbor and the East and Harlem Rivers, 63d Congress, First Session, Document 188.

Southern section, Beaufort, N. C., to Key West, Fla. 63d Congress, First Session, Document 229.

Upper Hudson River improvement connecting with the New York Barge Canal system and the Great Lakes, 61st Congress, Second Session, Document 719.

The following pages present a brief summary, section by section of the Atlantic Intracoastal Waterway survey, beginning at its southern terminus and proceeding northwardly, together with adjacent projects of importance in Florida, New York and New England.

It should be noted that the Atlantic intracoastal survey may be connected somewhere in the State of Florida with the Gulf intracoastal survey leading through protected waters to the Mississippi river at New Orleans, and this in turn with a further survey leading from New Orleans through protected waters along the Louisiana and the Texas coast as far as the international boundary at the Rio Grande.

It is suggested that those interested in the details of these surveys apply for the various public documents in which they are contained.

ATLANTIC
DEEPER WATERWAYS ASSOCIATION

815 CROZER BUILDING, PHILADELPHIA

GENERAL BOARD OF DIRECTORS

President

J. HAMPTON MOORE	Pennsylvania

Vice-Presidents

MAURICE RICH	Maine
O. L. FRISBEE,	New Hampshire
FREDERICK H. BABBITT	Vermont
FRANK FESSENDEN CRANE	Massachusetts
FRED. F. HALLIDAY, JR.	Rhode Island
ROLLIN S. WOODRUFF	Connecticut
——— ———	New York
FREDERICK W. DONNELLY	New Jersey
J. S. W. HOLTON	Pennsylvania
HIRAM R. BURTON	Delaware
JOSEPH C. WHITNEY	Maryland
GEORGE AINSLIE	Virginia
JOHN D. BIGGS	North Carolina
W. D. PORCHER	South Carolina
RICHARD J. DAVANT	Georgia
W. A. BOURS	Florida

Delegates

PERCY S. ACKERMAN	Maine
W. H. JAQUES	New Hampshire
FRANK E. HOWE	Vermont
JAMES E. LEWIS	Massachusetts
MICHAEL MOY,	Rhode Island
THEODORE BODENWEIN	Connecticut
EDW. F. MURRAY,	New York
H. R. KINGSLEY	New Jersey
EUGENE W. FRY	Pennsylvania
WILLIAM H. HEALD	Delaware
——— ———	Maryland
T. M. CARRINGTON	Virginia
A. T. BAKER	North Carolina
W. D. MORGAN	South Carolina
W. W. WILLIAMSON	Georgia
HARRY GOLDSTEIN	Florida

Secretary-Treasurer

WILFRED H. SCHOFF	Pennsylvania

Assistant Secretary

DURELL SHUSTER	Pennsylvania

COMPILED BY WILFRED H. SCHOFF
First edition, September, 1912; Second edition, February, 1914; Third edition, revised and enlarged, December, 1914; Fourth edition, September, 1915.

Nov. 23, 1917 AET

THE ATLANTIC INTRA-COASTAL WATERWAY

FOREWORD

THE Atlantic Deeper Waterways Association was organized in 1907 to promote the construction of a series of canals linking the natural bays and sounds along the Atlantic seaboard, in order to provide a modern protected free waterway, admitting heavy traffic, owned and operated by the United States government, between New England and Florida.

Pursuant to resolutions adopted by this Association, surveys along the entire route proposed were authorized by various acts of Congress, and these surveys have now been completed by the United States Army Engineer Corps and their recommendations with full details and plans of the surveys in the various sections are now in printed form for consideration by Congress.

Broadly speaking, the Army Engineers have reported favorably on the greater part of the project and have recommended immediate action on several of the links, and early future action on a number of those remaining.

These reports, with full details, have now been printed as government documents and may now be obtained under the following numbers:

Northern section, Boston, Mass., to Beaufort, N. C. 62d Congress, Second Session, Document 391; also 63d Congress, First Session, Document 196.

Improvements in New York Harbor and the East and Harlem Rivers, 63d Congress, First Session, Document 188.

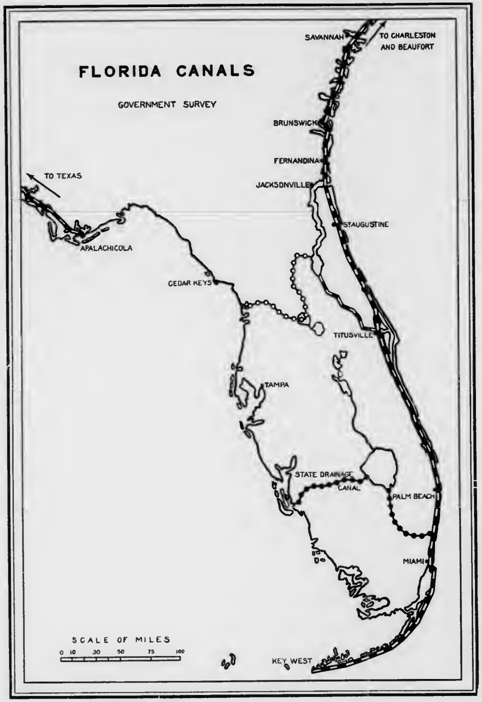
Southern section, Beaufort, N. C., to Key West, Fla. 63d Congress, First Session, Document 229.

Upper Hudson River improvement connecting with the New York Barge Canal system and the Great Lakes, 61st Congress, Second Session, Document 719.

The following pages present a brief summary, section by section of the Atlantic Intracoastal Waterway survey, beginning at its southern terminus and proceeding northwardly, together with adjacent projects of importance in Florida, New York and New England.

It should be noted that the Atlantic intracoastal survey may be connected somewhere in the State of Florida with the Gulf intracoastal survey leading through protected waters to the Mississippi river at New Orleans, and this in turn with a further survey leading from New Orleans through protected waters along the Louisiana and the Texas coast as far as the international boundary at the Rio Grande.

It is suggested that those interested in the details of these surveys apply for the various public documents in which they are contained.



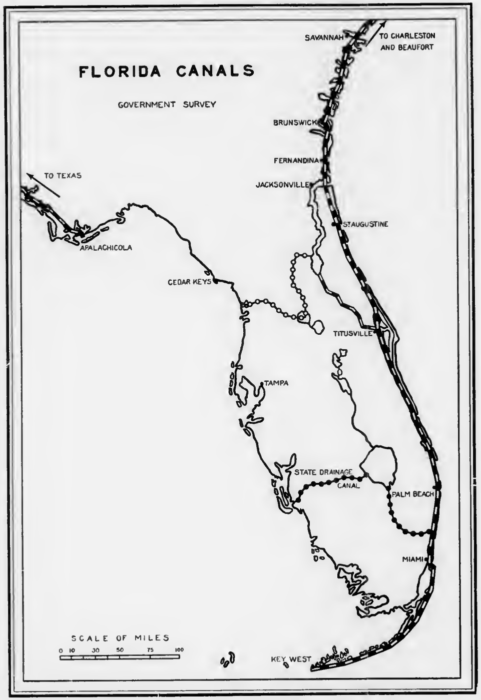
PALMETTO TREES.

FLORIDA CANALS

The east coast of Florida now possesses a chain of natural protected thoroughfares along the greater part of its length, navigable by vessels of light draft. Connecting canals, constructed by a corporation operating under State charter, are of insufficient dimensions, and a Florida association is urging Federal acquisition and improvement. In the southern portion of the State a series of canals is under construction by a State commission with the object of draining the Everglades, creating a great area of cultivable land as well as providing free passage across the State between the Atlantic and Gulf coasts. Furthermore, the State possesses a magnificent natural waterway in the St. Johns river, leading from the port of Jacksonville far into the interior of the fruit growing district, and it is anticipated that this river may be connected at some point with the Gulf intracoastal survey in order to form one of the links in the intracoastal chain from Florida to New Orleans.

The Engineers' report on the Atlantic intracoastal survey, within the limits of the State of Florida, is, in substance, as follows:

A 7-foot depth is already authorized or under construction between Charleston, S. C., and Jacksonville, Fla. Boats of 8-foot draft, under existing projects, will soon be able to ascend the St. Johns river 170 miles to Sanford on Lake Monroe, which is very near the Everglades basin where the State projects are under way. Along the east coast of Florida, between the St. Johns river and Key West, channels now exist that offer 4-foot draft, and further improvement thereof by the Federal government is not recommended under present conditions. The Engineers anticipate that an improved route between St. Johns river and the Gulf, when constructed, will proceed across the State and not around it.



PALMETTO TREES.

FLORIDA CANALS

The east coast of Florida now possesses a chain of natural protected thoroughfares along the greater part of its length, navigable by vessels of light draft. Connecting canals, constructed by a corporation operating under State charter, are of insufficient dimensions, and a Florida association is urging Federal acquisition and improvement. In the southern portion of the State a series of canals is under construction by a State commission with the object of draining the Everglades, creating a great area of cultivable land as well as providing free passage across the State between the Atlantic and Gulf coasts. Furthermore, the State possesses a magnificent natural waterway in the St. Johns river, leading from the port of Jacksonville far into the interior of the fruit growing district, and it is anticipated that this river may be connected at some point with the Gulf intracoastal survey in order to form one of the links in the intracoastal chain from Florida to New Orleans.

The Engineers' report on the Atlantic intracoastal survey, within the limits of the State of Florida, is, in substance, as follows:

A 7-foot depth is already authorized or under construction between Charleston, S. C., and Jacksonville, Fla. Boats of 8-foot draft, under existing projects, will soon be able to ascend the St. Johns river 170 miles to Sanford on Lake Monroe, which is very near the Everglades basin where the State projects are under way. Along the east coast of Florida, between the St. Johns river and Key West, channels now exist that offer 4-foot draft, and further improvement thereof by the Federal government is not recommended under present conditions. The Engineers anticipate that an improved route between St. Johns river and the Gulf, when constructed, will proceed across the State and not around it.

Photos from the Jacksonville Board of Trade.

JACKSONVILLE, FLORIDA, AND THE ST. JOHNS RIVER.

Photographs by Wilfred H. Schoff.

SAVANNAH OLD AND NEW

1 and 6. Glimpses in "Factors' Walk."
2. Bay Street Mall, "Factors' Walk," former center of cotton trade.
3. Steamer passing railway terminals, Savannah.
4. Steamers passing in Savannah River; upriver craft in distance.
5. Railway terminals and storehouses, Savannah.

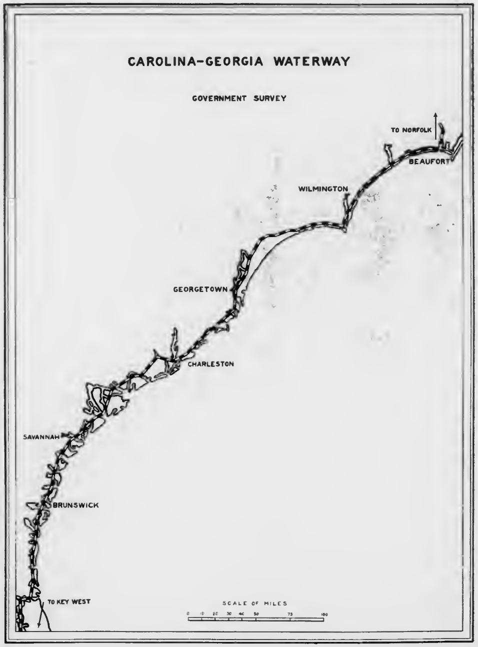
Photos from the Jacksonville Board of Trade.

JACKSONVILLE, FLORIDA, AND THE ST. JOHNS RIVER.

Photographs by Wilfred H. Schoff.

SAVANNAH OLD AND NEW

1 and 6. Glimpses in "Factors' Walk."
2. Bay Street Mall, "Factors' Walk," former center of cotton trade.
3. Steamer passing railway terminals, Savannah.
4. Steamers passing in Savannah River; upriver craft in distance.
5. Railway terminals and storehouses, Savannah.

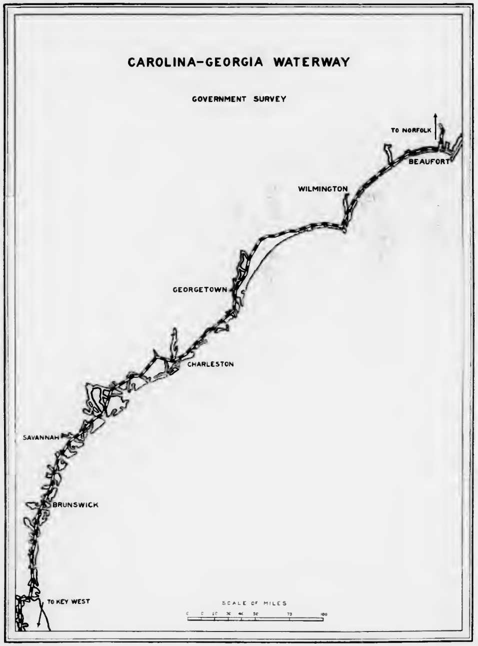


MOTOR BOAT IN SOUTHERN THOROUGHFARES.

ST. JOHNS RIVER TO BEAUFORT, N. C.

Under existing projects there will soon be available between the St. Johns river, Fernandina and Savannah protected channels affording 6-foot draft, 7-foot depth. Other channels affording 6-foot draft are available to Charleston and Winyah Bay; in some cases requiring a wait for the tides at the shallow places. The present recommendation of the chief of engineers in this section is that the government expend between the St. Johns river and Charleston, $870,000; and between Charleston and Winyah Bay, $1,230,000; total, $2,100,000, "as may be found necessary or desirable in the improvement of existing 6-foot draft routes." Between Winyah Bay, Cape Fear and Beaufort, N. C., a 6-foot draft, 7-foot depth is recommended, and the chief of engineers selects as the first section of this southern route to be completed that between Beaufort, N. C., and Cape Fear, at an estimated cost of $2,900,000. The section between Cape Fear and Winyah Bay to follow at a cost estimated at $9,400,000.

The entire distance between Beaufort, N. C. and the St. Johns river is therefore to be covered under present recommendations by a 6-foot draft, 7-foot depth passage at a total cost of $14,400,000. The "first half of the work to progress at a rate of about $800,000 per year, and progress on the last half to be gauged by the results of the first half."

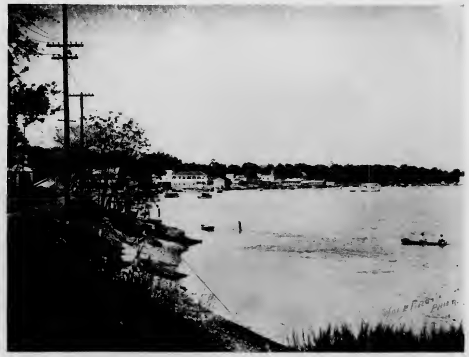


MOTOR BOAT IN SOUTHERN THOROUGHFARES.

ST. JOHNS RIVER TO BEAUFORT, N. C.

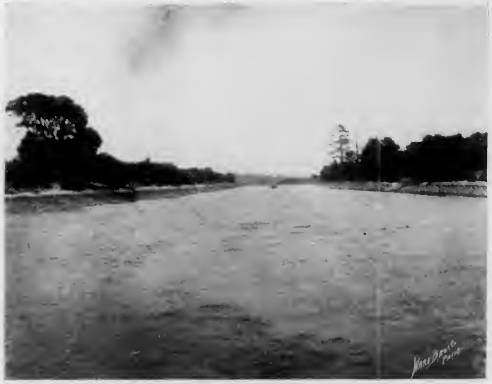
Under existing projects there will soon be available between the St. Johns river, Fernandina and Savannah protected channels affording 6-foot draft, 7-foot depth. Other channels affording 6-foot draft are available to Charleston and Winyah Bay; in some cases requiring a wait for the tides at the shallow places. The present recommendation of the chief of engineers in this section is that the government expend between the St. Johns river and Charleston, $870,000; and between Charleston and Winyah Bay, $1,230,000; total, $2,100,000, "as may be found necessary or desirable in the improvement of existing 6-foot draft routes." Between Winyah Bay, Cape Fear and Beaufort, N. C., a 6-foot draft, 7-foot depth is recommended, and the chief of engineers selects as the first section of this southern route to be completed that between Beaufort, N. C., and Cape Fear, at an estimated cost of $2,900,000. The section between Cape Fear and Winyah Bay to follow at a cost estimated at $9,400,000.

The entire distance between Beaufort, N. C. and the St. Johns river is therefore to be covered under present recommendations by a 6-foot draft, 7-foot depth passage at a total cost of $14,400,000. The "first half of the work to progress at a rate of about $800,000 per year, and progress on the last half to be gauged by the results of the first half."

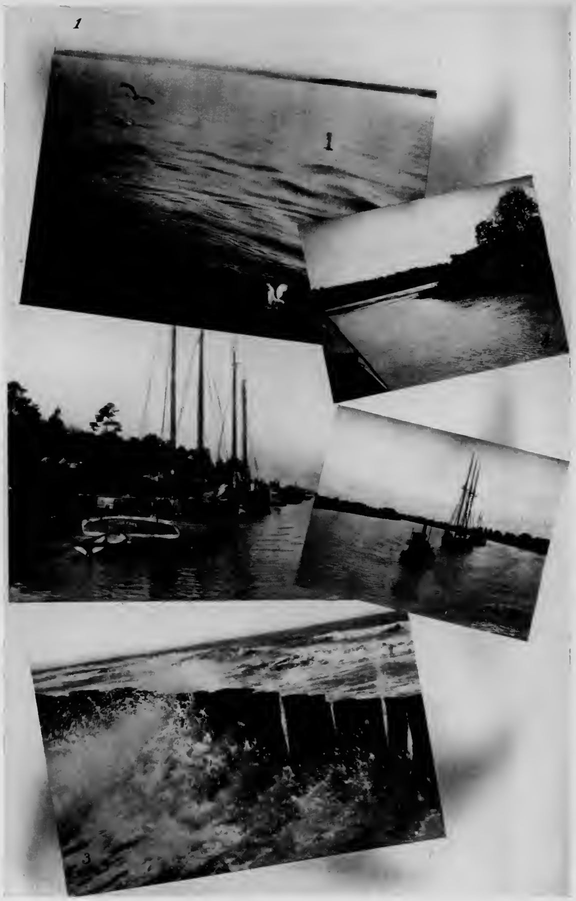


Photograph by Wilfred H. Schoff.

PORTION OF ATLANTIC INTRACOASTAL WATERWAY
AT THUNDERBOLT, NEAR SAVANNAH, GA.

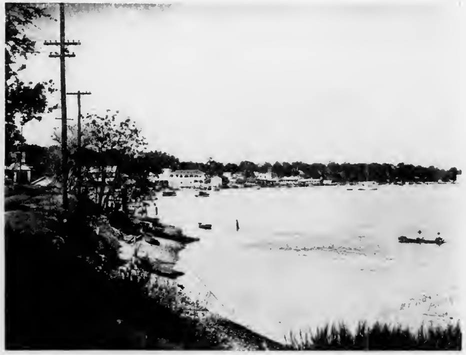


PORTION OF COMPLETED SECTION OF ATLANTIC INTRACOASTAL WATERWAY, CHARLESTON, S. C., TO SAVANNAH, GA.



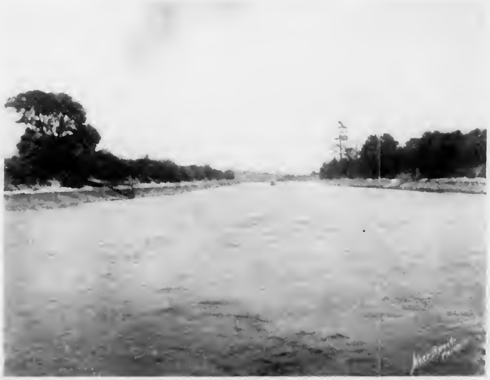
VIRGINIA AND CAROLINA

1. Inside of Cape Hatteras. Photo by Addison B. Burk.
2. Inland Waterway—Norfolk to Albemarle Sound.
3. Outside of Cape Hatteras. Photo by Addison B. Burk.
4. Dutch Gap Canal, James River, Va. Photo by Wilfred H. Schoff.
5. Coal-carrying craft on the James River, Va. Photo by Wilfred H. Schoff.

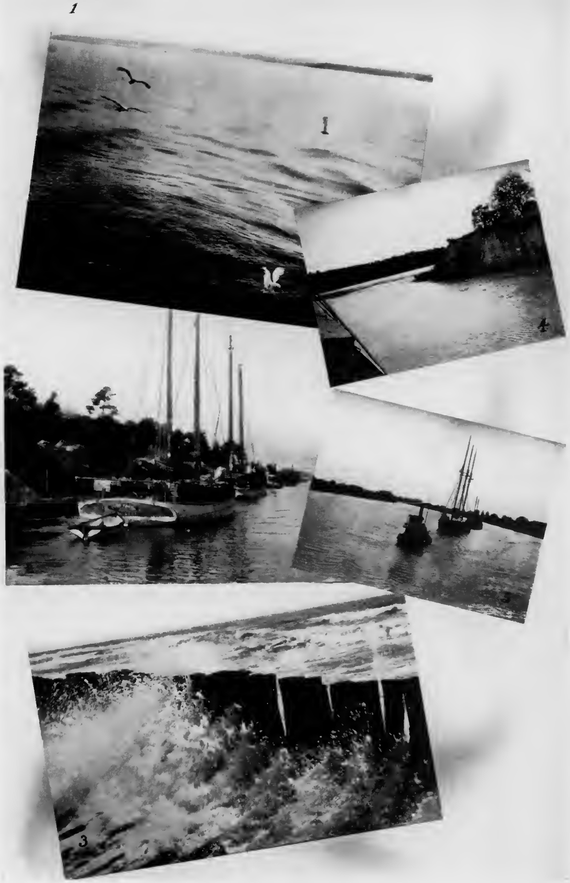


Photograph by Wilfred H. Schoff.

PORTION OF ATLANTIC INTRACOASTAL WATERWAY
AT THUNDERBOLT, NEAR SAVANNAH, GA.

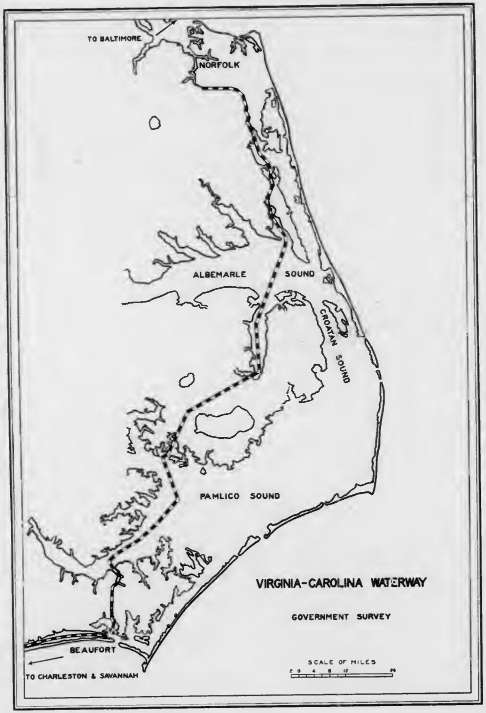


PORTION OF COMPLETED SECTION OF ATLANTIC INTRACOASTAL WATERWAY, CHARLESTON, S. C., TO SAVANNAH, GA.



VIRGINIA AND CAROLINA

1. Inside of Cape Hatteras. Photo by Addison B. Burk.
2. Inland Waterway—Norfolk to Albemarle Sound.
3. Outside of Cape Hatteras. Photo by Addison B. Burk.
4. Dutch Gap Canal, James River, Va. Photo by Wilfred H. Schoff.
5. Coal-carrying craft on the James River, Va. Photo by Wilfred H. Schoff.



ENTRANCE TO CHESAPEAKE AND ALBEMARLE CANAL.

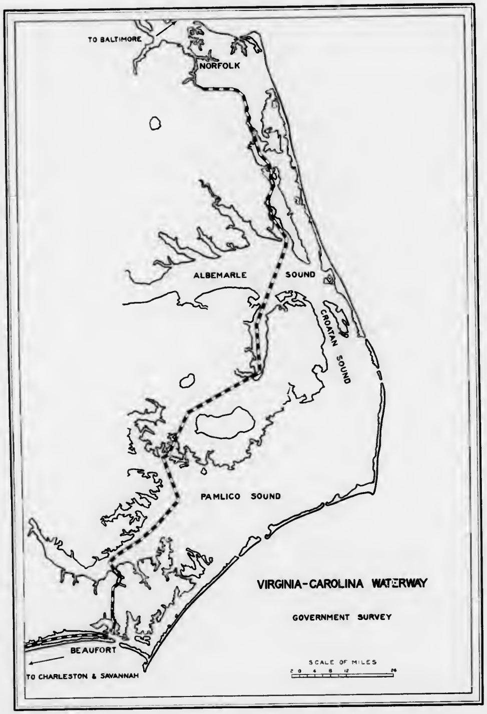
BEAUFORT, N. C. TO HAMPTON ROADS, VA.

The recommendation of the chief of engineers covered the construction of a waterway 12 feet deep between Norfolk, Va., and Beaufort Inlet, N. C., at a total cost of $5,400,000, and passing through Pamlico and Albemarle Sounds. This entire section is to be at sea level.

Under a provision included in the River and Harbor Act of 1912, the Chesapeake and Albemarle Canal has been acquired and taken over by the Federal Government. Free passage has thus been provided between Hampton Roads and Albemarle Sound by way of the Elizabeth River, the C. & A. Canal and Currituck Sound. Abolition of tolls on this old waterway has already stimulated traffic through it, but a much more rapid development may be anticipated upon the completion of its improvement to project dimensions of 12 feet depth at sea level.

The 12 foot intracoastal connection between Albemarle and Pamlico Sounds will be by way of Alligator River, Rose Bay and Adams Creek, as shown on the diagram, avoiding the passage through Croatan Sound where adverse stream flow and tide conditions would interfere with maintenance of the 12 foot channel depth.

The connection between Pamlico Sound and the ocean at Beaufort Inlet has been completed by the Federal Government to a depth of 10 feet, the passage having been successfully operated for the past four years. Under existing law this depth will be increased to 12 feet in order to provide uniform dimensions from Norfolk to Beaufort.



ENTRANCE TO CHESAPEAKE AND ALBEMARLE CANAL.

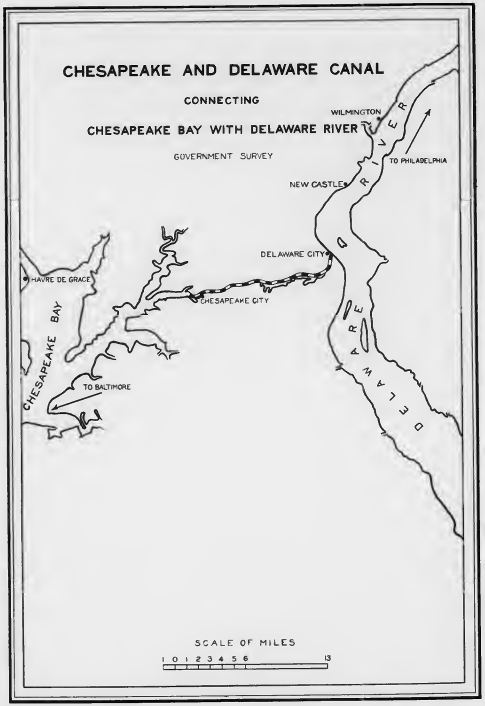
BEAUFORT, N. C. TO HAMPTON ROADS, VA.

The recommendation of the chief of engineers covered the construction of a waterway 12 feet deep between Norfolk, Va., and Beaufort Inlet, N. C., at a total cost of $5,400,000, and passing through Pamlico and Albemarle Sounds. This entire section is to be at sea level.

Under a provision included in the River and Harbor Act of 1912, the Chesapeake and Albemarle Canal has been acquired and taken over by the Federal Government. Free passage has thus been provided between Hampton Roads and Albemarle Sound by way of the Elizabeth River, the C. & A. Canal and Currituck Sound. Abolition of tolls on this old waterway has already stimulated traffic through it, but a much more rapid development may be anticipated upon the completion of its improvement to project dimensions of 12 feet depth at sea level.

The 12 foot intracoastal connection between Albemarle and Pamlico Sounds will be by way of Alligator River, Rose Bay and Adams Creek, as shown on the diagram, avoiding the passage through Croatan Sound where adverse stream flow and tide conditions would interfere with maintenance of the 12 foot channel depth.

The connection between Pamlico Sound and the ocean at Beaufort Inlet has been completed by the Federal Government to a depth of 10 feet, the passage having been successfully operated for the past four years. Under existing law this depth will be increased to 12 feet in order to provide uniform dimensions from Norfolk to Beaufort.



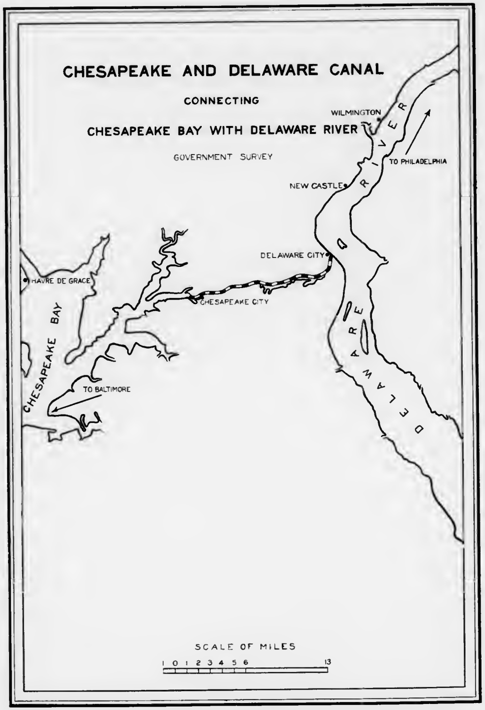
A Reminiscence—the Philadelphia Delegation to the Baltimore Convention of 1908, Passing Through the Chesapeake & Delaware Canal.

CHESAPEAKE AND DELAWARE CANAL

The final recommendation of the chief of engineers submitted to Congress August 9, 1913, with reference to the connecting waterway between Chesapeake Bay and Delaware river is as follows:

> "It is advisable for the United States to buy the Chesapeake & Delaware Canal at a cost to the United States not exceeding $2,514,290, and to then enlarge it to a sea level canal 12 feet deep and 90 feet bottom width with the least interference practicable to existing traffic . . . . at a cost which amounts in round numbers to $8,000,000, of which $3,000,000 should be made available by the first appropriation, and economical work will then require subsequent appropriations of from $500,000 to $1,000,000 per year.
>
> "Further deepening to 25 feet at an extra cost of $4,500,000 should await further observation as to the commercial changes resulting from the first increase in canal depth, and especially the release from canal tolls. . . . . The general public benefit will be that due to the increase of commerce by use of barges in tows and of medium draught boats, and the added benefits accruing from heavy draught boats will be mainly local, and, consequently, should await co-operation by the local States or those most directly benefited. . . . . It will always be possible to increase the depths above 12 feet up to 25 feet as fast as local co-operation furnishes the funds."

The above final report of the chiet of engineers makes the Chesapeake and Delaware link the next one in the survey to be pressed to the attention of Congress. Early and favorable action for taking over this canal is earnestly desired, and is essential in order to provide continuous navigation between North and South.



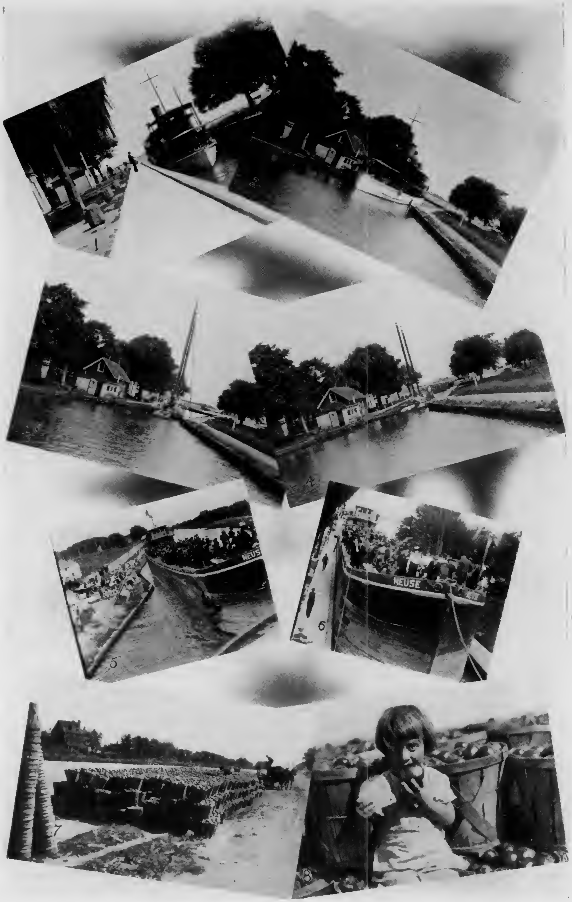
A Reminiscence—the Philadelphia Delegation to the Baltimore Convention of 1908, Passing Through the Chesapeake & Delaware Canal.

CHESAPEAKE AND DELAWARE CANAL

The final recommendation of the chief of engineers submitted to Congress August 9, 1913, with reference to the connecting waterway between Chesapeake Bay and Delaware river is as follows:

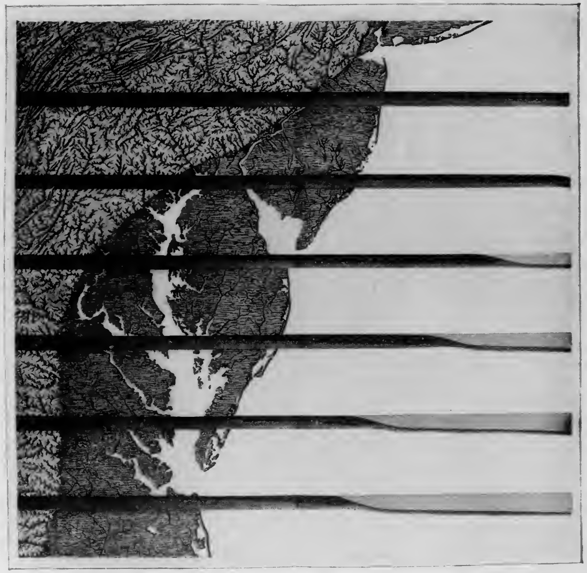
> "It is advisable for the United States to buy the Chesapeake & Delaware Canal at a cost to the United States not exceeding $2,514,290, and to then enlarge it to a sea level canal 12 feet deep and 90 feet bottom width with the least interference practicable to existing traffic . . . . at a cost which amounts in round numbers to $8,000,000, of which $3,000,000 should be made available by the first appropriation, and economical work will then require subsequent appropriations of from $500,000 to $1,000,000 per year.
>
> "Further deepening to 25 feet at an extra cost of $4,500,000 should await further observation as to the commercial changes resulting from the first increase in canal depth, and especially the release from canal tolls. . . . . The general public benefit will be that due to the increase of commerce by use of barges in tows and of medium draught boats, and the added benefits accruing from heavy draught boats will be mainly local, and, consequently, should await co-operation by the local States or those most directly benefited. . . . . It will always be possible to increase the depths above 12 feet up to 25 feet as fast as local co-operation furnishes the funds."

The above final report of the chief of engineers makes the Chesapeake and Delaware link the next one in the survey to be pressed to the attention of Congress. Early and favorable action for taking over this canal is earnestly desired, and is essential in order to provide continuous navigation between North and South.



ON THE CHESAPEAKE AND DELAWARE CANAL.

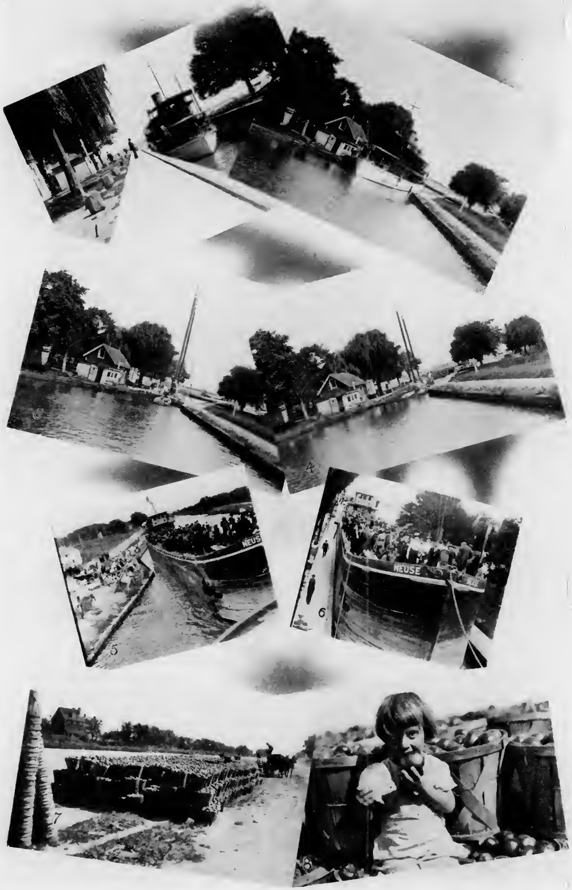
1. Power boat entering lock at Delaware City.
2. Same boat locked into canal.
3. Schooner entering lock.
4. Same schooner ready to leave canal.
5. Modern barge entering St. George's Lock.
6. Same barge in lock, showing limitations of present antiquated canal.
7. Part of Delaware's tomato crop awaiting shipment.
8. Some of it that did not get shipped. Note—Canal toll of 6 cents per 10 baskets was said to have some effect also in discouraging shipment.



STEREOGRAM OF THE MIDDLE ATLANTIC SLOPE.

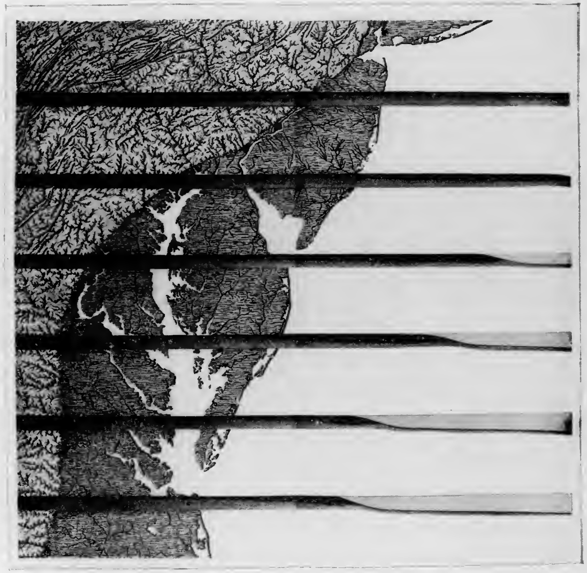
The dark area is alluvial soil drained at tide level; the light is upland and mountain, soil over rock. The line where the two meet is the Atlantic Fall Line.

The Atlantic Intracoastal Waterway will run through alluvial plains at tide level, under the cheapest and easiest possible conditions of construction.



ON THE CHESAPEAKE AND DELAWARE CANAL.

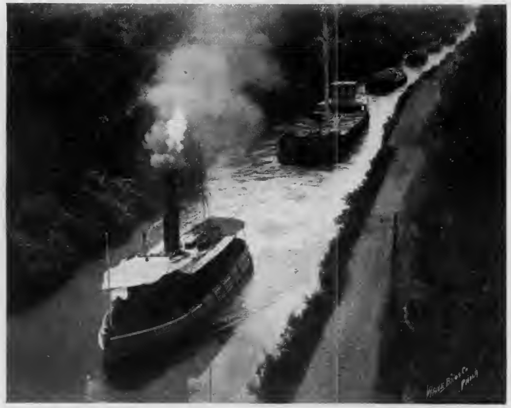
1. Power boat entering lock at Delaware City.
2. Same boat locked into canal.
3. Schooner entering lock.
4. Same schooner ready to leave canal.
5. Modern barge entering St. George's Lock.
6. Same barge in lock, showing limitations of present antiquated canal.
7. Part of Delaware's tomato crop awaiting shipment.
8. Some of it that did not get shipped. Note—Canal toll of 6 cents per 10 baskets was said to have some effect also in discouraging shipment.



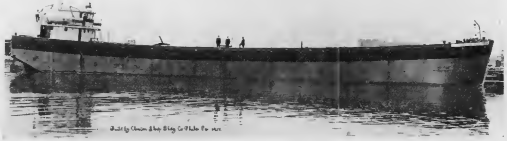
STEREOGRAM OF THE MIDDLE ATLANTIC SLOPE.

The dark area is alluvial soil drained at tide level; the light is upland and mountain, soil over rock. The line where the two meet is the Atlantic Fall Line.

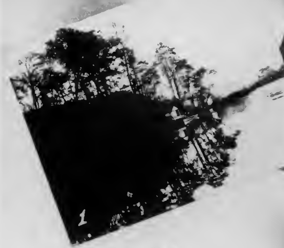
The Atlantic Intracoastal Waterway will run through alluvial plains at tide level, under the cheapest and easiest possible conditions of construction.



OLD-FASHIONED SMALL BARGES IN THE CHESAPEAKE AND DELAWARE CANAL.
ABOUT 300 TONS CAPACITY.

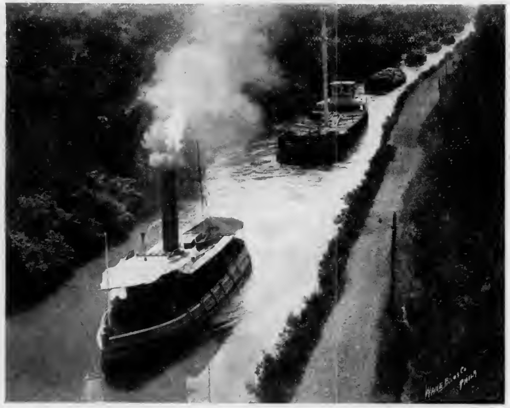


MODERN BARGE FOR CHESAPEAKE AND DELAWARE CANAL TRAFFIC.
1,000 TONS CAPACITY, BUT UNABLE TO LOAD MORE THAN 800 TONS OWING TO INADEQUATE DIMENSIONS OF CANAL.



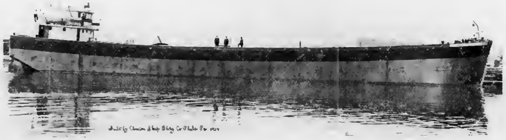
NEW JERSEY.

1. The Bonaparte landing, Crosswicks Creek, near Bordentown, N. J. Two tidal creeks, Crosswicks and Cheesequake, are followed by the canal survey across New Jersey.
2. Crosswicks Creek, N. J. A portion of the route of the New Jersey ship canal. Photos by Wilfred H. Schoff.
3. Coal Barges tied abreast in Delaware River at Philadelphia, awaiting shipment by ocean route to New England.
4. The fate of the Coastwise Sailing Fleet. Schooner foundering off Nantucket. Photo by C. W. Ward, Kissimmee, Fla.
5. Coal Barges inward hound, near the Delaware Breakwater.



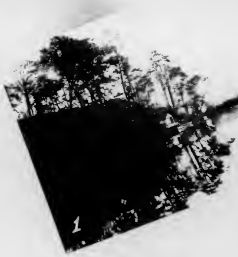
OLD-FASHIONED SMALL BARGES IN THE CHESAPEAKE AND DELAWARE CANAL.

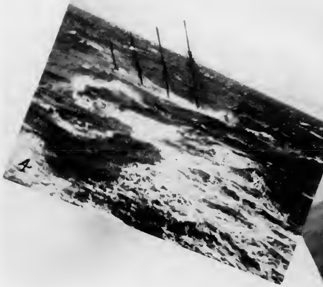
ABOUT 300 TONS CAPACITY.



MODERN BARGE FOR CHESAPEAKE AND DELAWARE CANAL TRAFFIC.

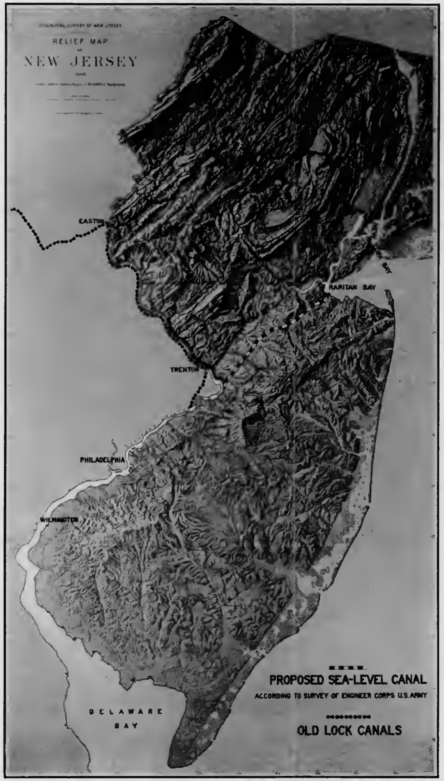
1,000 TONS CAPACITY, BUT UNABLE TO LOAD MORE THAN 800 TONS OWING TO INADEQUATE DIMENSIONS OF CANAL.





NEW JERSEY.

1. The Bonaparte landing, Crosswicks Creek, near Bordentown, N. J. Two tidal creeks, Crosswicks and Cheesequake, are followed by the canal survey across New Jersey.
2. Crosswicks Creek, N. J. A portion of the route of the New Jersey ship canal. Photos by Wilfred H. Schoff.
3. Coal Barges tied abreast in Delaware River at Philadelphia, awaiting shipment by ocean route to New England.
4. The fate of the Coastwise Sailing Fleet. Schooner foundering off Nantucket. Photo by C. W. Ward, Kissimmee, Fla.
5. Coal Barges inward bound, near the Delaware Breakwater.



THE DELAWARE RIVER

Connection between the terminus of the Chesapeake and Delaware canal and the entrance between the proposed New Jersey canal is afforded by the Delaware river. Under existing projects a depth of 35 feet will soon be available to Allegheny Avenue, Philadelphia, and a depth of 12 feet between Philadelphia and Trenton, N. J., is now available. The entrance to the canal will be at Bordentown, N. J.

THE NEW JERSEY CANAL

The report of the chief of engineers with respect to this link follows:

"The chief of engineers concurs with the special board in its view that some day a 25 feet depth sea level canal will be advisable across the State of New Jersey from New York Bay to the Delaware River. . . . . Any new canal should be built over a route susceptible of development into a deep draft sea level canal. A less depth than 25 feet will take reasonable care of present demands of commerce . . . . The majority of the increased tonnage will be that of barges of from one thousand to two thousand tons." And the recommendation of the chief of engineers is therefore for "a lock canal of 12 feet depth and 90 feet bottom width, provided the State of New Jersey, or other local parties, will promptly secure and donate to the United States all rights of way necessary for a 125 feet bottom width, 25 feet depth sea level canal along the same route . . . . and provided that the 12 feet depth canal construction work be carried on . . . . in such a way as to allow of a greater development to a 25 feet depth canal whenever such development is found advisable."

Estimates of the cost of the various types of canal reported by the chief of engineers is as follows:

Lock canal, 12 feet depth	$20,000,000
Lock canal, 25 feet depth	30,000,000
Sea level canal, 12 feet depth	33,000,000
Sea level canal, 25 feet depth	45,000,000

The chief of engineers further discusses the possibility of future participation of cost in constructing a sea level canal of 25 feet depth by the States of Pennsylvania and New Jersey, as being interested parties in such an improvement.

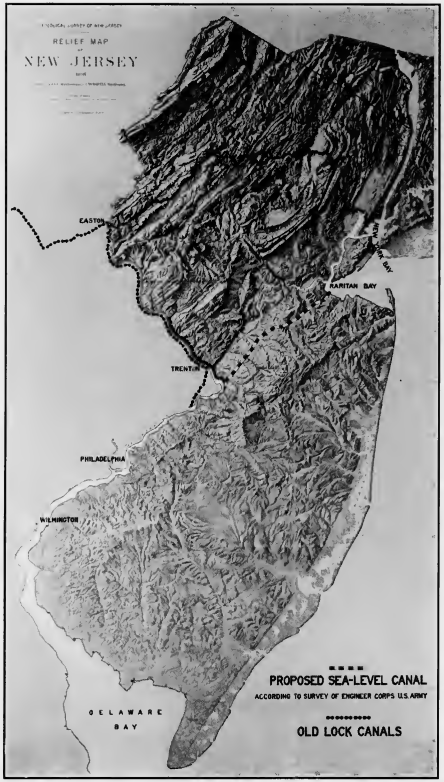
The new survey follows tidal streams through alluvial soil and marshland, and abandons the old Delaware and Raritan Canal route, which traverses rocky and hilly country and could not be modernized except at prohibitive cost.

This New Jersey link is absolutely essential in order to connect the southern waterways with New York and New England, and the early adoption of the project and commencement of the work are to be urged upon Congress at the first possible opportunity.

The State of New Jersey is in full accord with this project and has appropriated $500,000 for the purchase of a right of way for this canal route to be presented to the United States Government, and through a State commission is surveying the route and charting the real estate to be acquired for the right of way.

STATEN ISLAND SOUND

There is a natural protected deep waterway—the Staten Island Sound, comprising the Arthur Kill and the Kill von Kull—connecting Raritan Bay with New York Bay. The development of water front sites along this waterway in recent years for manufacturing purposes and for commercial terminals has been remarkable, and even greater development is expected.



THE DELAWARE RIVER

Connection between the terminus of the Chesapeake and Delaware canal and the entrance between the proposed New Jersey canal is afforded by the Delaware river. Under existing projects a depth of 35 feet will soon be available to Allegheny Avenue, Philadelphia, and a depth of 12 feet between Philadelphia and Trenton, N. J., is now available. The entrance to the canal will be at Bordentown, N. J.

THE NEW JERSEY CANAL

The report of the chief of engineers with respect to this link follows:

"The chief of engineers concurs with the special board in its view that some day a 25 feet depth sea level canal will be advisable across the State of New Jersey from New York Bay to the Delaware River. . . . . Any new canal should be built over a route susceptible of development into a deep draft sea level canal. A less depth than 25 feet will take reasonable care of present demands of commerce . . . . The majority of the increased tonnage will be that of barges of from one thousand to two thousand tons." And the recommendation of the chief of engineers is therefore for "a lock canal of 12 feet depth and 90 feet bottom width, provided the State of New Jersey, or other local parties, will promptly secure and donate to the United States all rights of way necessary for a 125 feet bottom width, 25 feet depth sea level canal along the same route . . . . and provided that the 12 feet depth canal construction work be carried on . . . . in such a way as to allow of a greater development to a 25 feet depth canal whenever such development is found advisable."

Estimates of the cost of the various types of canal reported by the chief of engineers is as follows:

Lock canal, 12 feet depth	$20,000,000
Lock canal, 25 feet depth	30,000,000
Sea level canal, 12 feet depth	33,000,000
Sea level canal, 25 feet depth	45,000,000

The chief of engineers further discusses the possibility of future participation of cost in constructing a sea level canal of 25 feet depth by the States of Pennsylvania and New Jersey, as being interested parties in such an improvement.

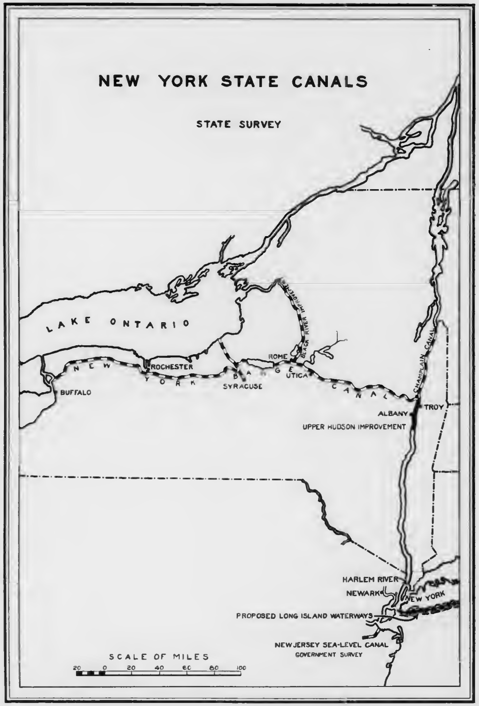
The new survey follows tidal streams through alluvial soil and marshland, and abandons the old Delaware and Raritan Canal route, which traverses rocky and hilly country and could not be modernized except at prohibitive cost.

This New Jersey link is absolutely essential in order to connect the southern waterways with New York and New England, and the early adoption of the project and commencement of the work are to be urged upon Congress at the first possible opportunity.

The State of New Jersey is in full accord with this project and has appropriated $500,000 for the purchase of a right of way for this canal route to be presented to the United States Government, and through a State commission is surveying the route and charting the real estate to be acquired for the right of way.

STATEN ISLAND SOUND

There is a natural protected deep waterway—the Staten Island Sound, comprising the Arthur Kill and the Kill von Kull—connecting Raritan Bay with New York Bay. The development of water front sites along this waterway in recent years for manufacturing purposes and for commercial terminals has been remarkable, and even greater development is expected.

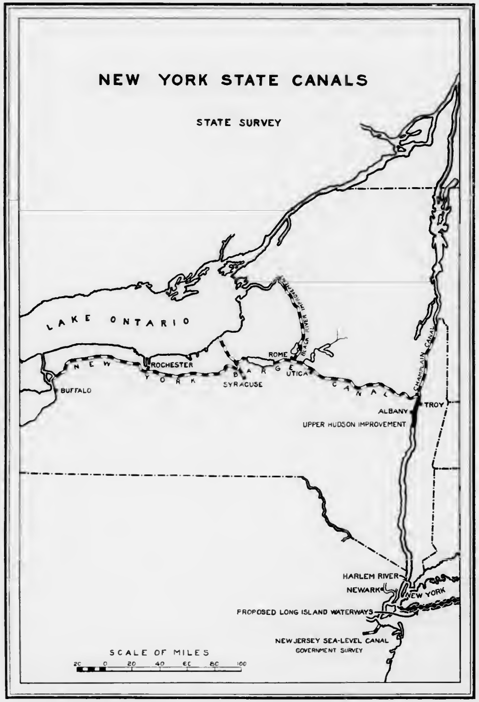


BETWEEN THE ATLANTIC AND THE GREAT LAKES

Between the Hudson River at Waterford, N. Y., and Lake Erie at North Tonawanda, the State of New York is now bringing to completion one of the most extensive engineering projects ever undertaken in the United States, involving an entire reconstruction of the old Erie canal, by which the State of New York first attained its dominant position in American affairs. Leaving

1. View of lock and dam at Mechanicville. Dam in place before work on canal started. Lock placed at end of existing dam.
2. View of dam at Delta Reservoir; in the foreground, the Black River Canal with the aqueduct and locks.
3. View of the north end of fixed dam across Mohawk River at Vischer's Ferry, showing head gates and small lock.
4. View of lock at part of the fixed dam across Mohawk River at Vischer's Ferry. Power house shown under construction.

(Photographs from N. Y. State Engineer's Office, Albany.)



BETWEEN THE ATLANTIC AND THE GREAT LAKES

Between the Hudson River at Waterford, N. Y., and Lake Erie at North Tonawanda, the State of New York is now bringing to completion one of the most extensive engineering projects ever undertaken in the United States, involving an entire reconstruction of the old Erie canal, by which the State of New York first attained its dominant position in American affairs. Leaving

1. View of lock and dam at Mechanicville. Dam in place before work on canal started. Lock placed at end of existing dam.
2. View of dam at Delta Reservoir; in the foreground, the Black River Canal with the aqueduct and locks.
3. View of the north end of fixed dam across Mohawk River at Vischer's Ferry, showing head gates and small lock.
4. View of lock at part of the fixed dam across Mohawk River at Vischer's Ferry. Power house shown under construction.

(Photographs from N. Y. State Engineer's Office, Albany.)

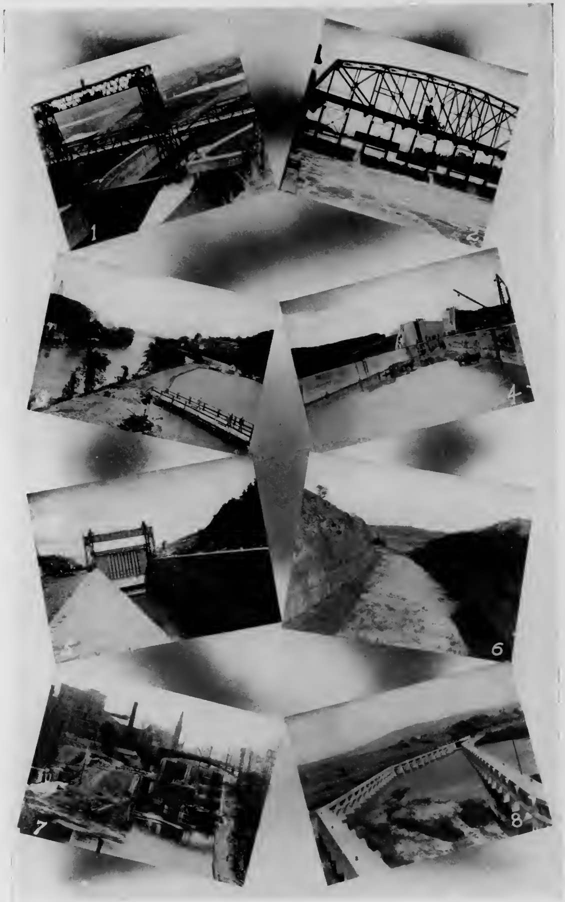
the Hudson River at Waterford the canal rises by a flight of five cement locks to the Mohawk River, which is canalized by a series of movable dams. The central section of the canal is fed by two great dams that impound the waters of the western Adirondack region. The canal then enters Oneida Lake and proceeds thence to Lockport over an excavated route, following in large measure the present Erie Canal route. Connection is provided by branch canals, with Lake Champlain, and with Lake Ontario at Oswego; also with Cayuga and Seneca Lakes; and connecting spurs are afforded the cities of Syracuse and Rochester. Statistics follow:

Erie branch	323.3	miles
Number of locks	35	
Oneida Lake, forming part of the route	19	“
Spurs to Syracuse and Rochester	10.26	“
Champlain branch	61.5	“
Number of locks	11	
Oswego branch	22.8	“
Number of locks	7	
Cayuga and Seneca branch	27.3	“
Number of locks	4	
Cayuga and Seneca Lakes, connected with barge canal	65	“
Width of channel, land line surface section, bottom, minimum	75	feet
Width of channel, land line, water surface	123 to 171	“
Width of channel, land line, lock section, bottom, minimum	94	“
Width of channel, river line, bottom, general	200	“
Depth of channel, land line and minimum river line	12	“
Locks, length between gates	328	“
Available length	310	“
Width of chamber	45	“
Depth of sills	12	“
Dams, new	28	
Dams, old with new crests	6	
Dams, old, without change	5	
Boats, capacity utilizing full lock width	3,000	tons
Boats, built for two to pass in most restricted channels, and two for traveling tandem to be locked at one lockage	1,500	“
Appropriation, Erie, Champlain and Oswego Canals	$101,000,000	
Appropriation, Cayuga and Seneca Canals	7,000,000	
Appropriations, canal terminals	19,000,000	
Additional appropriation subject to referendum, to complete canal system	27,000,000	

This New York canal system, built by the State exclusively, provides a direct connection from the Atlantic Intracoastal Waterway to the Great Lakes, and by way of Lake Champlain to the St. Lawrence River in Canada.

The illustrations on the opposite page are of scenes on the New York State Barge Canal. The particular points shown by each picture are as follows:

1. Safety gate closing canal section at Mohawk River, Crescent Dam in distance.
2. Movable bridge dam spanning Mohawk River; 8 such dams canalize the entire river.
3. Mohawk River and Barge Canal at Little Falls.
4. One of five locks by which the canal ascends from the Hudson to the Mohawk at Waterford, N. Y.
5. Lift lock at Little Falls. Highest in the world—40 ft. 6 in. lift.
6. Cut between Mohawk River and Lock No. 5, New York Barge Canal.
7. Canal locks at Lockport, N. Y., showing 5 Erie Canal locks retained for local traffic, and 2 Barge Canal locks, same height lift for through traffic.
8. Concrete guide ways in pool above lock, Waterford.



Photographs by Wilfred H. Schoff.

VIEWS OF THE NEW YORK STATE BARGE CANAL.
(SEE OPPOSITE PAGE).

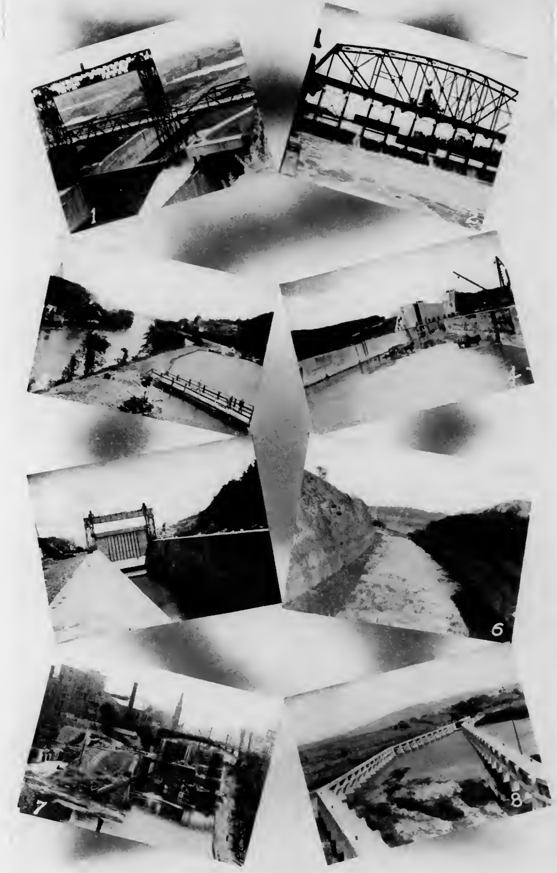
the Hudson River at Waterford the canal rises by a flight of five cement locks to the Mohawk River, which is canalized by a series of movable dams. The central section of the canal is fed by two great dams that impound the waters of the western Adirondack region. The canal then enters Oneida Lake and proceeds thence to Lockport over an excavated route, following in large measure the present Erie Canal route. Connection is provided by branch canals, with Lake Champlain, and with Lake Ontario at Oswego; also with Cayuga and Seneca Lakes; and connecting spurs are afforded the cities of Syracuse and Rochester. Statistics follow:

Erie branch	323.3	miles
Number of locks	35	
Oneida Lake, forming part of the route	19	"
Spurs to Syracuse and Rochester	10.26	"
Champlain branch	61.5	"
Number of locks	11	
Oswego branch	22.8	"
Number of locks	7	
Cayuga and Seneca branch	27.3	"
Number of locks	4	
Cayuga and Seneca Lakes, connected with barge canal	65	"
Width of channel, land line surface section, bottom, minimum	75	feet
Width of channel, land line, water surface	123 to 171	"
Width of channel, land line, lock section, bottom, minimum	94	"
Width of channel, river line, bottom, general	200	"
Depth of channel, land line and minimum river line	12	"
Locks, length between gates	328	"
Available length	310	"
Width of chamber	45	"
Depth of sills	12	"
Dams, new	28	
Dams, old with new crests	6	
Dams, old, without change	5	
Boats, capacity utilizing full lock width	3.000	tons
Boats, built for two to pass in most restricted channels, and two for traveling tandem to be locked at one lockage	1,500	"
Appropriation, Erie, Champlain and Oswego Canals	$101,000,000	
Appropriation, Cayuga and Seneca Canals	7,000,000	
Appropriations, canal terminals	19.000,000	
Additional appropriation subject to referendum, to complete canal system	27.000,000	

This New York canal system, built by the State exclusively, provides a direct connection from the Atlantic Intracoastal Waterway to the Great Lakes, and by way of Lake Champlain to the St. Lawrence River in Canada.

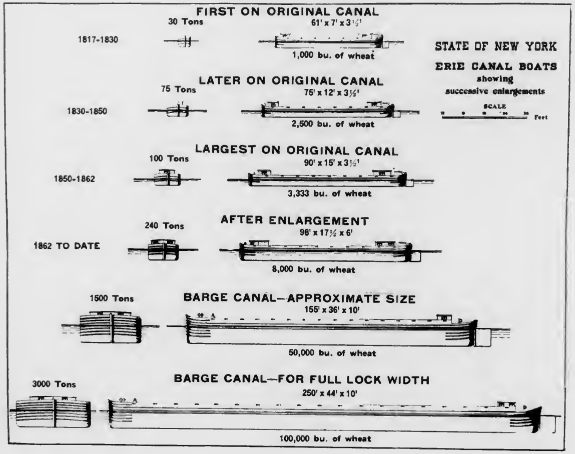
The illustrations on the opposite page are of scenes on the New York State Barge Canal. The particular points shown by each picture are as follows:

1. Safety gate closing canal section at Mohawk River, Crescent Dam in distance.
2. Movable bridge dam spanning Mohawk River; 8 such dams canalize the entire river.
3. Mohawk River and Barge Canal at Little Falls.
4. One of five locks by which the canal ascends from the Hudson to the Mohawk at Waterford, N. Y.
5. Lift lock at Little Falls. Highest in the world—40 ft. 6 in. lift.
6. Cut between Mohawk River and Lock No. 5, New York Barge Canal.
7. Canal locks at Lockport, N. Y., showing 5 Erie Canal locks retained for local traffic, and 2 Barge Canal locks, same height lift for through traffic.
8. Concrete guide ways in pool above lock. Waterford.



Photographs by Wilfred H. Schoff.

VIEWS OF THE NEW YORK STATE BARGE CANAL.
(SEE OPPOSITE PAGE).



Photographs from N. Y. State Engineer's Office, Albany.

STATE BARGE CANAL TERMINAL, ALBANY, N. Y.

LAKE CHAMPLAIN

The connection between the Intracoastal Waterway and Canada is provided by the Champlain Canal (part of the State Barge Canal system), Lake Champlain and the Richelieu River, thus providing direct water communication with Montreal and Quebec, points on the St. Lawrence River, the Saguenay, Ottawa and the great projected system of Canadian internal waterways.

In order to provide adequate connection between the Barge Canal terminus at Whitehall and deep water in Lake Champlain, Federal improvement of the Champlain Narrows, Whitehall to Crown Point, 37 miles, an interstate waterway, will be necessary.

UPPER HUDSON RIVER

The State Barge Canal System enters the Hudson River at Waterford, N. Y. Between Waterford and Hudson, about 39 miles, the river is in course of improvement by the Federal Government, the present project contemplating a channel depth of 12 feet. The work comprises a great concrete dam and lock with 16 foot lift at Troy, providing slackwater navigation between Troy and Waterford. Between Troy and Hudson, the river is being dredged and the channel controlled by dikes. This channel depth of 12 feet will be uniform with the Barge Canal dimensions. The business interests at Troy and Albany anticipate, however, that large transfers of traffic will take place at the head of the river, and are, therefore, urging provision for a greater channel depth as far as the Troy dam, the depth suggested being 27 feet, and on this request Congress has authorized a survey by the Army Engineers. It seems altogether probable that the head of the river will become an important freight transfer point, and that Federal improvement of the stream beyond Barge Canal dimensions will be advisable.

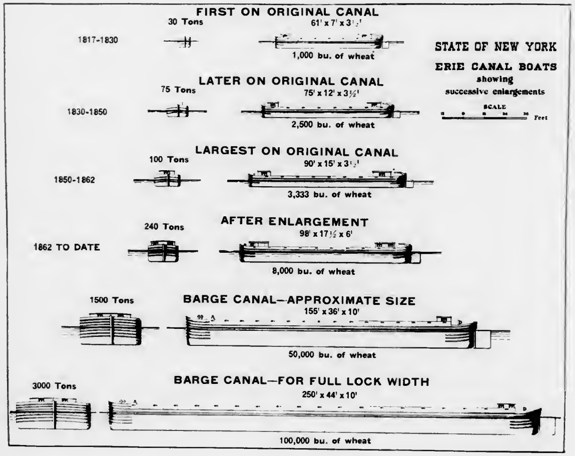
Between Hudson, N. Y., and New York harbor, the Hudson River already possesses sufficient depth for modern traffic, except at a few points such as Haverstraw Bay, where dredging of sandbars is required.

NEW YORK CITY

In and about New York City are projects for the improvement of Spuyten Duyvil Creek, the Harlem River, and the Bronx Kills, connecting Hudson River with Long Island Sound without passing around the lower city; also extensive improvements in the East River to attain a greater depth of channel and a less velocity of tide. The recommendation of the chief of engineers is for the construction of the Harlem Kills channel to a depth of 18 feet, and for the completion of a 35-foot channel through the East River,

removing dangerous rocks, at a cost of	$ 8,616,780
For further improvements giving access to the wharves on the eastern side of the river, at a cost of	2,129,458
For improved channel east of Blackwell's Island	1,877,000
Sundry auxiliary works	775,281
Or, in round numbers	$13,400,000

These improvements once made will be practically permanent. The first appropriation recommended is of $500,000, subsequent appropriations to be not less than $500,000 per annum until completion of the work.



Photographs from N. Y. State Engineer's Office, Albany.

STATE BARGE CANAL TERMINAL, ALBANY, N. Y.

LAKE CHAMPLAIN

The connection between the Intracoastal Waterway and Canada is provided by the Champlain Canal (part of the State Barge Canal system), Lake Champlain and the Richelieu River, thus providing direct water communication with Montreal and Quebec, points on the St. Lawrence River, the Saguenay, Ottawa and the great projected system of Canadian internal waterways.

In order to provide adequate connection between the Barge Canal terminus at Whitehall and deep water in Lake Champlain, Federal improvement of the Champlain Narrows, Whitehall to Crown Point, 37 miles, an interstate waterway, will be necessary.

UPPER HUDSON RIVER

The State Barge Canal System enters the Hudson River at Waterford, N. Y. Between Waterford and Hudson, about 39 miles, the river is in course of improvement by the Federal Government, the present project contemplating a channel depth of 12 feet. The work comprises a great concrete dam and lock with 16 foot lift at Troy, providing slackwater navigation between Troy and Waterford. Between Troy and Hudson, the river is being dredged and the channel controlled by dikes. This channel depth of 12 feet will be uniform with the Barge Canal dimensions. The business interests at Troy and Albany anticipate, however, that large transfers of traffic will take place at the head of the river, and are, therefore, urging provision for a greater channel depth as far as the Troy dam, the depth suggested being 27 feet, and on this request Congress has authorized a survey by the Army Engineers. It seems altogether probable that the head of the river will become an important freight transfer point, and that Federal improvement of the stream beyond Barge Canal dimensions will be advisable.

Between Hudson, N. Y., and New York harbor, the Hudson River already possesses sufficient depth for modern traffic, except at a few points such as Haverstraw Bay, where dredging of sandbars is required.

NEW YORK CITY

In and about New York City are projects for the improvement of Spuyten Duyvil Creek, the Harlem River, and the Bronx Kills, connecting Hudson River with Long Island Sound without passing around the lower city; also extensive improvements in the East River to attain a greater depth of channel and a less velocity of tide. The recommendation of the chief of engineers is for the construction of the Harlem Kills channel to a depth of 18 feet, and for the completion of a 35-foot channel through the East River, removing dangerous rocks, at a cost of........................$ 8,616,780

For further improvements giving access to the wharves on the eastern side of the river, at a cost of......................	2,129,458
For improved channel east of Blackwell's Island..............	1,877,000
Sundry auxiliary works	775,281
Or, in round numbers	$13,400,000

These improvements once made will be practically permanent. The first appropriation recommended is of $500,000, subsequent appropriations to be not less than $500,000 per annum until completion of the work.

HUDSON RIVER BETWEEN ALBANY AND TROY, SHOWING PORTION OF FEDERAL IMPROVEMENT.

Photographs by Wilfred H. Schoff.

SITE OF MUNICIPAL DOCKS, TROY, N. Y.

The crowds on the waterfront are extending the welcome of the city of Troy to the Seventh Annual Convention of the Atlantic Deeper Waterways Association.

Photograph by Wilfred H. Schoff.

GOVERNMENT DAM AT TROY, SHOWING WORK SUSPENDED DURING DEBATE ON A RIVER AND HARBOR BILL.

Photo by Detroit Publishing Co.

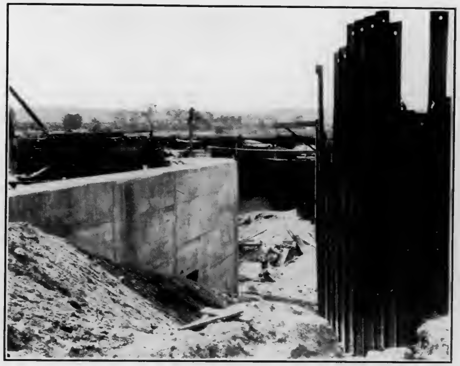
BARGES IN TOW ON THE HUDSON RIVER, WEST POINT, N. Y.

HUDSON RIVER BETWEEN ALBANY AND TROY, SHOWING PORTION OF FEDERAL IMPROVEMENT.

Photographs by Wilfred H. Schoff.

SITE OF MUNICIPAL DOCKS, TROY, N. Y.

The crowds on the waterfront are extending the welcome of the city of Troy to the Seventh Annual Convention of the Atlantic Deeper Waterways Association.



Photograph by Wilfred H. Schoff.

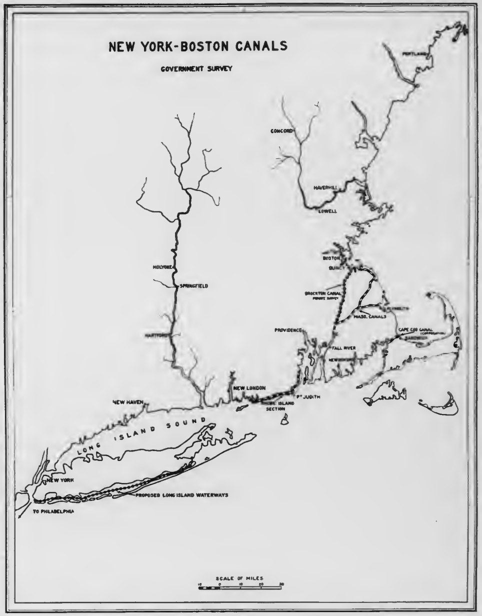
GOVERNMENT DAM AT TROY, SHOWING WORK SUSPENDED DURING DEBATE ON A RIVER AND HARBOR BILL.

Photo by Detroit Publishing Co.

BARGES IN TOW ON THE HUDSON RIVER, WEST POINT, N. Y.

Photos by Wilfred H. Schoff. NEW YORK CITY.

1. Spuyten Duyvil Creek at its junction with Hudson River, New York City.
2. Barge traffic in heavy freight, Harlem River, New York City.
3. Manhattan Island, New York City—Meeting point of three great lines of traffic:—(1) Long Island Sound and East River; (2) Hudson River, Barge Canal and Great Lakes; (3) Atlantic Intracoastal Waterway as far as Florida waters.
4. Spuyten Duyvil Creek, New York City—Showing portion to be straightened to provide barge passage between Hudson River and Long Island Sound.
5. Barge Tow on Hudson River, Weehawken, N. J.
6. Barge Tow on East River, New York City.



NEW ENGLAND

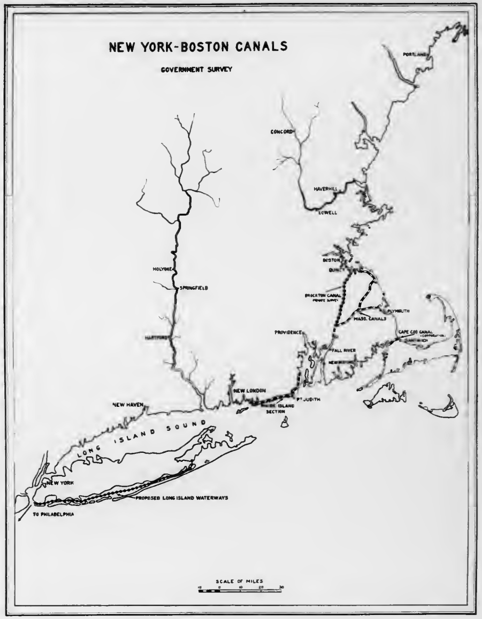
The Atlantic Intracoastal Waterway, together with the New York Barge Canal system and its Hudson River connection, will reach New England waters by means of Long Island Sound. This is a natural protected waterway of sufficient depth and width for any purpose of navigation, and requires no improvement.

Two projects are included in the engineers' survey in the New England district: one, a protected waterway through the lagoons of the Rhode Island shore, connecting Fisher's Island Sound with Narragansett Bay and avoiding the dangers of Point Judith; the other, a waterway connecting Narragansett Bay with Massachusetts Bay or Boston harbor.

The special board of survey laid down a canal route between Fisher's Island Sound and Narragansett Bay at a depth of 18 feet, bottom width 125 feet; estimated cost $12,322,000. The State of Rhode Island has undertaken to provide a free right of way for the canal to the extent of an appropriation

Photos by Wilfred H. Schoff. NEW YORK CITY.

1. Spuyten Duyvil Creek at its junction with Hudson River, New York City.
2. Barge traffic in heavy freight, Harlem River, New York City.
3. Manhattan Island, New York City—Meeting point of three great lines of traffic:—(1) Long Island Sound and East River; (2) Hudson River, Barge Canal and Great Lakes; (3) Atlantic Intracoastal Waterway as far as Florida waters.
4. Spuyten Duyvil Creek, New York City—Showing portion to be straightened to provide barge passage between Hudson River and Long Island Sound.
5. Barge Tow on Hudson River, Weehawken, N. J.
6. Barge Tow on East River, New York City.



NEW ENGLAND

The Atlantic Intracoastal Waterway, together with the New York Barge Canal system and its Hudson River connection, will reach New England waters by means of Long Island Sound. This is a natural protected waterway of sufficient depth and width for any purpose of navigation, and requires no improvement.

Two projects are included in the engineers' survey in the New England district: one, a protected waterway through the lagoons of the Rhode Island shore, connecting Fisher's Island Sound with Narragansett Bay and avoiding the dangers of Point Judith; the other, a waterway connecting Narragansett Bay with Massachusetts Bay or Boston harbor.

The special board of survey laid down a canal route between Fisher's Island Sound and Narragansett Bay at a depth of 18 feet, bottom width 125 feet; estimated cost $12,322,000. The State of Rhode Island has undertaken to provide a free right of way for the canal to the extent of an appropriation of $500,000. The reviewing board and the chief of engineers have not concurred with the survey board and are not convinced that present commercial needs would justify this expenditure. They have not therefore recommended that the work be instituted at the present time. Further agitation of this question may be undertaken at any time by the parties interested, as the surveys completed by the present board are still a matter of public record and may be again taken up under resolution of Congress. The dimensions chosen by the engineers for the route south of New York, 12 feet depth and 90 feet bottom width, would be less expensive and perhaps more feasible.

The question of connection of Narragansett Bay with the port of Boston is somewhat complex. The army engineers, acting under the resolution of Congress, have completed surveys that proceed from Fall River to the head of navigation on the Taunton River, thence across intervening territory to the watershed of the North River, and thence to Hingham Bay, a part of Boston harbor. There is also in operation at the present time, built by a private corporation, a toll canal of 30 feet depth connecting Buzzards Bay with Barnstable Bay, crossing the peninsula of Cape Cod and known as the Cape Cod Canal.

The special survey board submitted its surveys with estimates of cost varying from $17,453,000 for a canal 18 feet deep, with bottom width of 125 feet, and summit level of 20 feet, by way of Taunton to Plymouth, to $40,047,000 for a canal 25 feet deep, with bottom width of 200 feet, and summit level of 35 feet, by way of Taunton to Hingham Bay. The board further reported that "at the present time there appears to be no commercial necessity sufficient to justify the construction of a canal over either of these inland routes. After other sections of the proposed intracoastal waterway have been constructed, and after the measure of worth to commerce to be afforded by the Cape Cod Ship Canal has been demonstrated, the question of the need for a completely sheltered waterway between Narragansett Bay and Boston should receive further consideration."

The question of the possibility of the acquisition of the Cape Cod Canal by the United States Government was thus considered by the engineers:

"The economic value of the Cape Cod Canal with its exposed approaches has not yet been established. It has not been considered advisable for the United States to enter into any negotiation looking to the acquisition of this canal at the present time. After its completion the question of its acquirement, based on its value as a going concern, may be worthy of further consideration."

A portion of the engineers' survey between Fall River and Boston follows the Taunton River to the head of navigation, and this river is now in course of improvement under both State and Federal aid.

The Cape Cod Canal is a ship canal at sea level, 8½ miles in length, and vessels passing through it avoid entirely the dangers of Cape Cod. There remains, however, the passage between its eastern terminus at Sandwich and Boston harbor, over an exposed ocean route not suited to ordinary canal barge traffic.

The surveys made by the Army Engineers for the Massachusetts section of the intracoastal waterway are still available. The report of the engineers merely postpones final consideration thereof and the subject may again be brought up for consideration at any time by resolution of Congress. As in the case of the Rhode Island link, a survey on the dimensions adopted south of New York might lead to a more favorable report.

Photograph by Wilfred H. Schoff.

SCHOONERS UNDER TOW ON LONG ISLAND SOUND.

of $500,000. The reviewing board and the chief of engineers have not concurred with the survey board and are not convinced that present commercial needs would justify this expenditure. They have not therefore recommended that the work be instituted at the present time. Further agitation of this question may be undertaken at any time by the parties interested, as the surveys completed by the present board are still a matter of public record and may be again taken up under resolution of Congress. The dimensions chosen by the engineers for the route south of New York, 12 feet depth and 90 feet bottom width, would be less expensive and perhaps more feasible.

The question of connection of Narragansett Bay with the port of Boston is somewhat complex. The army engineers, acting under the resolution of Congress, have completed surveys that proceed from Fall River to the head of navigation on the Taunton River, thence across intervening territory to the watershed of the North River, and thence to Hingham Bay, a part of Boston harbor. There is also in operation at the present time, built by a private corporation, a toll canal of 30 feet depth connecting Buzzards Bay with Barnstable Bay, crossing the peninsula of Cape Cod and known as the Cape Cod Canal.

The special survey board submitted its surveys with estimates of cost varying from $17,453,000 for a canal 18 feet deep, with bottom width of 125 feet, and summit level of 20 feet, by way of Taunton to Plymouth, to $40,047,000 for a canal 25 feet deep, with bottom width of 200 feet, and summit level of 35 feet, by way of Taunton to Hingham Bay. The board further reported that "at the present time there appears to be no commercial necessity sufficient to justify the construction of a canal over either of these inland routes. After other sections of the proposed intracoastal waterway have been constructed, and after the measure of worth to commerce to be afforded by the Cape Cod Ship Canal has been demonstrated, the question of the need for a completely sheltered waterway between Narragansett Bay and Boston should receive further consideration."

The question of the possibility of the acquisition of the Cape Cod Canal by the United States Government was thus considered by the engineers:

"The economic value of the Cape Cod Canal with its exposed approaches has not yet been established. It has not been considered advisable for the United States to enter into any negotiation looking to the acquisition of this canal at the present time. After its completion the question of its acquirement, based on its value as a going concern, may be worthy of further consideration."

A portion of the engineers' survey between Fall River and Boston follows the Taunton River to the head of navigation, and this river is now in course of improvement under both State and Federal aid.

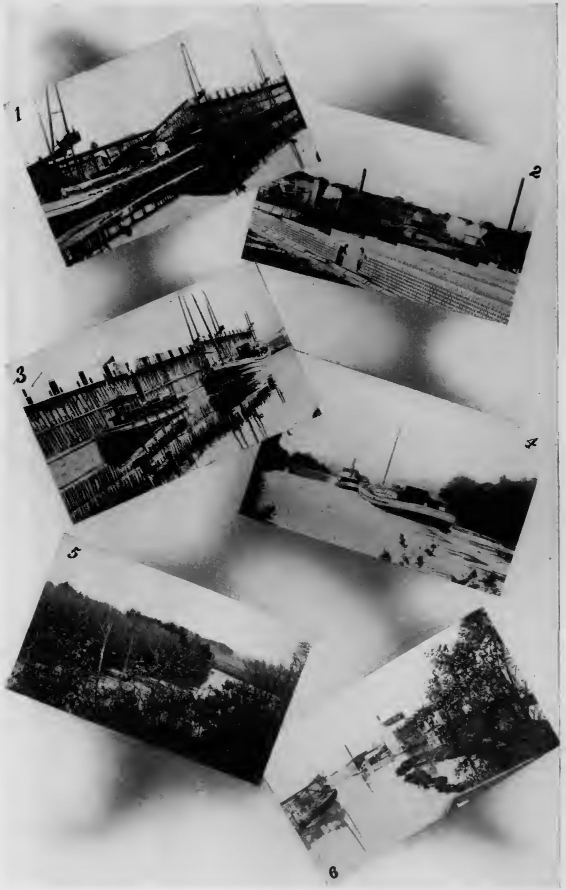
The Cape Cod Canal is a ship canal at sea level, 8½ miles in length, and vessels passing through it avoid entirely the dangers of Cape Cod. There remains, however, the passage between its eastern terminus at Sandwich and Boston harbor, over an exposed ocean route not suited to ordinary canal barge traffic.

The surveys made by the Army Engineers for the Massachusetts section of the intracoastal waterway are still available. The report of the engineers merely postpones final consideration thereof and the subject may again be brought up for consideration at any time by resolution of Congress. As in the case of the Rhode Island link, a survey on the dimensions adopted south of New York might lead to a more favorable report.

Photograph by Wilfred H. Schoff.

SCHOONERS UNDER TOW ON LONG ISLAND SOUND.

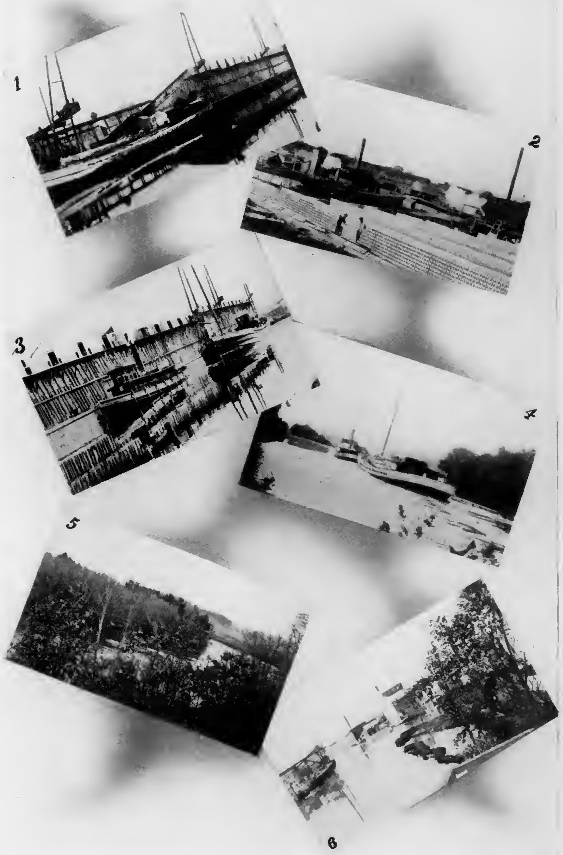
1. PROVIDENCE, R. I. 2. NEW BEDFORD, MASS. 3. FALL RIVER, MASS.



TAUNTON RIVER, MASS.

1 and 3. Coal pockets with barge alongside, Taunton. Heavy freight inbound.
2. Brick yards, Taunton. Heavy freight outbound.
4. Tugboat and barge, Taunton River. Size limited by present channel dimensions.
5. Taunton River north of Taunton—Showing nature of the watercourses followed by the Intracoastal Survey.
6. Taunton, Mass. Head of navigation on the Taunton River.

1. PROVIDENCE, R. I. 2. NEW BEDFORD, MASS. 3. FALL RIVER, MASS.



TAUNTON RIVER, MASS.

1 and 3. Coal pockets with barge alongside, Taunton. Heavy freight inbound.
2. Brick yards, Taunton. Heavy freight outbound.
4. Tugboat and barge, Taunton River. Size limited by present channel dimensions.
5. Taunton River north of Taunton—Showing nature of the watercourses followed by the Intracoastal Survey.
6. Taunton, Mass. Head of navigation on the Taunton River.

SUMMARY

The following are the sections of the Atlantic Intracoastal Waterway route as now recommended by the engineers:

St. Johns River, Fla., to Fernandina, Fla., 7 feet depth Work under way.	$251,726.75
Fernandina, Fla., to Savannah River, Ga., 7 feet depth Work under way.	195,000.00
Savannah River, Ga., to Charleston Harbor, S. C., 7 feet depth Work partly under way.	427,400.00
Charleston Harbor, S. C., to Winyah Bay, S. C., 7 feet depth Construction recommended.	1,227,800.00
Winyah Bay, S. C., to Little River, S. C., 7 feet depth Construction recommended.	5,677,800.00
Little River, S. C., to Cape Fear, N. C., 7 feet depth Construction recommended.	3,724,219.00
Cape Fear, N. C., to Beaufort, N. C., 7 feet depth Construction recommended.	2,872,111.00
Total Southern Section Atlantic Intracoastal Waterway, St. Johns River, Fla., to Beaufort Inlet, N. C., in round numbers	$14,400,000.00
Beaufort Inlet, N. C., to Norfolk, Va., 12 feet depth Project approved by Congress; work partly completed. Chesapeake and Albemarle Canal purchased. Much of the route lies in Pamlico and Albemarle Sounds, natural waterways requiring no improvement.	5,400,000.00
Norfolk, Va., to head of Chesapeake Bay, Md. Natural waterway requiring no improvement.	
Chesapeake Bay to Delaware River, 12 feet depth Recommended for immediate action, including purchase or condemnation of existing Chesapeake and Delaware Canal.	8,000,000.00
Delaware City, Del., to Bordentown, N. J. Route follows channel of the Delaware River, for which present depth is sufficient over the entire distance, assuming a 12 feet project.	
Bordentown, N. J., to South Amboy, N. J., 12 feet depth Immediate construction recommended.	20,000,000.00
South Amboy, N. J., to New York Bay (and thence to Hudson River and Long Island Sound). Natural waterways requiring no improvement for a 12 feet project.	
Total Northern Section Atlantic Intracoastal Waterway, Beaufort Inlet, N. C., to New York Bay, in round numbers	$33,400,000.00
Total cost, Atlantic Intracoastal Waterway, as recommended by the Army Engineers	$47,800,000.00

LENGTH OF CONNECTING CANALS, ATLANTIC INTRACOASTAL WATERWAY

		Length of Excavation	
1.	New Jersey Canal (new project)	33.7	miles
2.	Chesapeake and Delaware (existing canal to be enlarged)	13.7	"
3.	Chesapeake and Albemarle (project adopted; existing canal being enlarged)	11.4	"
4.	Albemarle and Pamlico (Alligator River and Rose Bay) (project adopted)	26.3	"
5.	Beaufort Cut (project adopted; existing canal to be enlarged)	6	"
6.	Beaufort to Cape Fear River, N. C. (new project) (about)	5	"
7.	Cape Fear River to Little River, S. C. (new project) (about)	20	"
8.	Little River, S. C., to Winyah Bay, S. C. (new project) (about)	15	"
	Total Intracoastal Waterway links	131.1	miles

Total length of continuous navigation made possible by above canals connecting existing waterways (about)	1800	miles
Mileage of 148 rivers interconnected by Intracoastal Waterway	5365	"
New York Barge Canal System, including Central Lakes	500	"
Total length of Great Lakes which will connect with Intracoastal Waterway	1489	"
Lake Champlain, 126 miles; Richelieu River, 65 miles	191	"
St. Lawrence River (about)	1000	"
Canadian Inland Waterway (Georgian Bay Canal)	400	"

AVERAGE TARIFF PER TON MILE

Earthen Roads by Animal Power	25	cents
Steam Railroads	7.8	mills
Canals	2 to 3	mills
Rivers, Sounds, etc.	1	mill
Lakes and Ocean	0.5	mill

WHY THE COASTWISE SAILING FLEET IS DISAPPEARING AND THE ADVANTAGES TO COMMERCE AFFORDED BY BARGE TRAFFIC ON PROTECTED WATERWAYS

The coastwise sailing fleet is disappearing from the face of the seas; and while the barge fleet is steadily increasing, this is not being brought about in like proportion and cannot be developed in its full capacity without the creation of inside passages which will make its full advantages available.

TONNAGE CONSTRUCTED IN THE UNITED STATES.

	Sail	Barge		Sail	Barge
1900	116,460	40,310	1906	35,209	58,997
1901	126,165	74,655	1907	24,907	74,443
1902	97,698	58,416	1908	31,981	95,641
1903	89,979	72,177	1909	28,950	58,640
1904	64,908	55,137	1910	19,358	58,997
1905	79,418	49,948	1911	10,092	47,977
			1912	21,221	54,977

The shrinkage in the sailing fleet is not being made good. Coastwise business is therefore declining. The industries and communities which it served must suffer in proportion unless barge traffic can be built up to take its place.

REGISTERED TONNAGE OF THE UNITED STATES.

	Sail	Barge
1870	1,324,256	240,411
1875	1,362,138	390,158
1880	1,206,206	383,629
1885	1,101,593	299,451
1890	749,065	341,042
1895	586,142	382,632
1900	485,352	548,817
1905	353,333	681,512
1910	234,848	878,180

DISASTERS TO VESSELS, ATLANTIC AND GULF COASTS OF THE UNITED STATES, 10 YEARS, 1900 TO 1909, INCLUSIVE.

Number of vessels	5,715
Loss to vessels (known)	$30,380,915
Loss to cargoes (known)	$10,168,640
Vessels totally lost (known)	1,675
Vessels damaged (known and unknown)	4,040
Tonnage totally lost	483,743
Tonnage damaged	3,289,200
Lives lost	2,223

The known loss to vessels and cargoes in ten years is almost equal to the total cost of the proposed Atlantic Intracoastal Waterway, the opening of which would prevent a large percentage of that loss of life and property.

COMPARATIVE COSTS

	Schooner	Barge
Cost of construction	$40,000	$15,000
Crew and provisions, per month	445	90
Insurance per annum	2,800	637
Depreciation	2,000	750

These figures are for the ocean route between Norfolk and Philadelphia. The advantage in favor of the barge is even greater when calculated for the inside route.

ADVANTAGE OF AN INTRACOASTAL WATERWAY IN TIME OF WAR

As great as would be the advantage of our inland waterways in years of peace, their greatest advantages would come in time of war.

The wonderful development of transportation in recent years has brought every important nation within striking distance of all other nations, and at the same time has multiplied the magnitude and swiftness of war operations, so that modern wars have become substantially a test of the military preparations of the belligerents, and not of their resources. All of these developments have worked to the disadvantage of America. All other nations have leaped to arms, have organized their whole population into armies, and have taxed their finances upon their fleets, policies that weaken their resources, but increase enormously their preparations.

America alone has failed to organize her people into armies and has made slow progress even on her navy. Though our resources are relatively boundless, our preparations are woefully inferior, and a short war, testing only preparations, would leave us in humiliation and defeat. Therefore, our main objective in an important war must be to gain and bring our resources into play. The enemy's objective on the contrary would be to strike a staggering blow at once before our resources are brought to bear, seize our commercial centers, destroy our navy yards and ship yards and bring us to terms quickly. If we bring our resources to bear we should win; if we fail, we should lose the war.

Whether we succeed in gaining our main objective would depend very materially upon our inland waterways.

The conclusions to be drawn from examination of this are simple and clear:

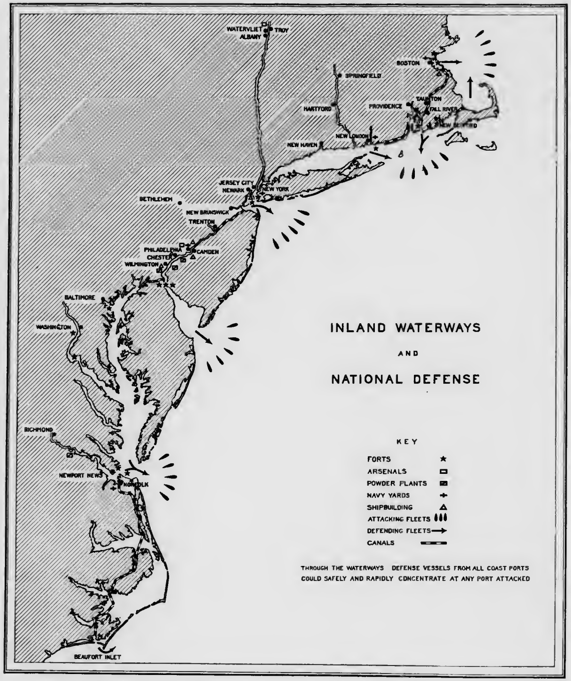
1. That our coastwise inland waterways next to our fleet itself can be made the most vital factor of national defense.

2. That the services of these waterways increase with the nation's peril. They are useful for economy and for building up plants in time of peace; they would always be a source of strength after the national defenses were well provided for. They are of paramount importance under our present inferior conditions of defense.

3. That in any war under present conditions they would afford our best chance of gaining the time necessary to organize our forces and develop our great resources. They would furnish the best refuge for our fleet, if outnumbered by the enemy, without permitting its blockade; they would make it possible for our fleet, though inferior to give battle after choosing its own time and conditions, and enable it to retire if necessary; they would make it possible to utilize and expand all our establishments for repairing and building ships and to assemble and concentrate ships as fast as ready.

4. That upon our coastwise inland waterways in their relation to the fleet would largely depend the security of our navy yards, shipyards and coast cities and our chance of escaping the knockout blows that would surely be aimed at our coast defenses the instant war were declared.

Summing up, even aside from the great commercial value of our coastwise inland waterways, their paramount vital importance in national defense would warrant and demand immediate measures on the part of Congress to bring about their full and speedy development.



INLAND WATERWAYS AND NATIONAL DEFENSE

THROUGH THE WATERWAYS DEFENSE VESSELS FROM ALL COAST PORTS COULD SAFELY AND RAPIDLY CONCENTRATE AT ANY PORT ATTACKED

THE INTRACOASTAL WATERWAY IN THE NATIONAL DEFENSE

[From addresses by Hon. Josephus Daniels, Secretary of the Navy, at the Seventh Annual Convention of the Atlantic Deeper Waterways Association, Albany and Troy Sessions, September, 1914.]

"It is a marvel; when you look at the coast line from Boston to New Orleans it seems as if Providence had lifted up a sand barrier between the hinterland and the tumultuous sea and bade us to go in and make it deep enough to float the navies of the world. Since Providence has put that work within our reach, it would be national suicide for us to fail to follow the lead.

"There are no ships in the navy so delicate as our submarines and destroyers, and when we send them on long cruises it costs thousands of dollars to repair them after they have had to go on the high seas. If we had this canal, these ships of light draft could go from one end of the Atlantic coast to the other, and the saving of the navy yard cost today in repairs would pay the interest on the investment; and this in time of peace when we have not many of these craft, when we have not so many as we must have if we learn the lesson of the war in Europe.

"You will recall how a submarine, affecting to be distressed, off Helgoland, managed to induce a German ship to come out into the open, and how a large English ship came and destroyed it; and you recall that a German submarine coming from under the surface of the ocean, from where nobody knew, sank three British cruisers. The lesson in that is that future warfare on the sea will be more and more largely controlled by submarines and small craft. We shall not, indeed, change the policy of building dreadnaughts, nor put our eggs all in one basket, but we have seen as never before proofs of the naval experts' opinion that the submarines and destroyers will exert more power in war than men have any dream of.

"I need but illustrate what the Kiel Canal is worth to Germany for you to see the incalculable importance of this canal to the navy. The English navy is larger than the German navy, and the German navy there is protected by this Kiel Canal. Its officers, its men, quietly go about their daily duties on their ships, while every English ship in the Channel has to compel every man to be on the alert, hardly having sleep. The purpose of the German navy seems to be to dart out into the North Sea and deliver a blow. In the meantime its own fleet is in no danger. If we should be so unfortunate as to be attacked, more than the dreadnaughts, more than the coast defenses, more than the army, would be our ability to send through every channel these death-dealing submarines into the ocean and prevent any foreign navy landing on our coast; so that when you are advocating this inland waterway, when you have the vision to see its importance to commerce—and I put that as the reason why the money should be forthcoming to construct this canal—still you see that in any emergency it would be vitally important to the national life that our ships, when the occasion called, should be in harbor, protected, ready to save our cities and our people.

"If this canal was constructed you could take these submarines and destroyers from Boston to New Orleans in these inner channels without hurt or injury. That is for peace. But if we should be so unfortunate—and I pray God we may never see it—as to have war, then the possession of an inland waterway channel would be essential to preserve efficiency and to enable us to defeat our opponents, because these little craft could ply to and fro, and dart out and deal a blow and return with little injury to themselves. That is the argument on the side of national defense.

"There is one other argument which I will give you most briefly in favor of this inland waterway canal. It is an argument for the preservation of human life. We have thought too little, until recently, of the lives of men who go down to the sea. We have, in Congress, and as a people, permitted conditions that have sacrificed the lives of men for commerce and trade on the sea, and until the Titanic disaster we never had even the beginning of proper protection and proper laws. I wish to give you the disasters to vessels on the Atlantic and Gulf Coasts during the ten years from 1899 to 1909. The number of vessels is 5,715. Loss to the vessels, known, $30,000,000; loss to the cargoes, known, $10,000,000. Vessels totally lost, 1,675; vessels damaged, 4,040. Tonnage totally lost, 483,743; tonnage damaged, 3,289,200. Lives lost, 2,223. The total cost of the Atlantic intracoastal waterway would be $47,800,000; so that if we could save a tithe of this material loss we could in a few years pay every dollar of the cost of these improvements which your Association is advocating.

"But who shall estimate the value of a human life; who shall put a money value upon the lives of the men sacrificed, when, for a few million dollars, we might make navigation easy and safe?"

FIVE AMERICAN SUBMARINES AND MONITOR TENDER
NAVAL REVIEW, HUDSON RIVER, JUNE, 1915
Photograph by Underwood and Underwood.

The Atlantic Deeper Waterways Association

815 Crozer Building, Philadelphia, Pa.

EXTRACTS FROM CONSTITUTION

ARTICLE I.

Name.

This organization shall be known as the "Atlantic Deeper Waterways Association."

ARTICLE II.

Objects.

a. The object of this Association shall be the collection, preparation and presentation to the Congress of the United States of statistics and other information bearing upon the question of the improvement or construction of inland waterways and of the improvement of the rivers and harbors which would form an integral part of such a line of waterways from Massachusetts Bay to the Gulf of Mexico.

b. To secure from the Congress appropriations for surveys and work for the systematic improvement of such rivers and harbors and the improvement or construction of inland or interior lines of waterways communicating with the rivers, harbors, bays or sounds, to the end that eventually there shall be an efficient system of waterways permitting the free movement of traffic by water between the various States from Maine to the Gulf.

ARTICLE III.

Membership.

The membership of this Association shall consist of commercial, manufacturing and kindred organizations, district waterway improvement associations, municipal and other corporations, companies and individual citizens who may subscribe to this constitution and contribute to the support and prosecution of the objects of the Association.

ARTICLE IX.

Dues.

Individual	$ 5	per	Annum
Firms or Corporations	10	"	"
Organizations of 250 or less	15	"	"
" " over 250 and less than 500	20	"	"
" " over 500 and less than 1,000	40	"	"
" " 1,000 and more	75	"	"
Waterway Associations	75	"	"
Municipalities of 5,000 or less	50	"	"
Municipalities of over 5,000	100	"	"

The Association desires to enlist every person, firm and organization within its territory, interested in the achievement of its plans.

If any member knows of another whose influence would help the cause, why not urge that friend to join at once?

of this inland waterway canal. It is an argument for the preservation of human life. We have thought too little, until recently, of the lives of men who go down to the sea. We have, in Congress, and as a people, permitted conditions that have sacrificed the lives of men for commerce and trade on the sea, and until the Titanic disaster we never had even the beginning of proper protection and proper laws. I wish to give you the disasters to vessels on the Atlantic and Gulf Coasts during the ten years from 1899 to 1909. The number of vessels is 5,715. Loss to the vessels, known, $30,000,000; loss to the cargoes, known, $10,000,000. Vessels totally lost, 1,675; vessels damaged, 4,040. Tonnage totally lost, 483,743; tonnage damaged, 3,289,200. Lives lost, 2,223. The total cost of the Atlantic intracoastal waterway would be $47,800,000; so that if we could save a tithe of this material loss we could in a few years pay every dollar of the cost of these improvements which your Association is advocating.

"But who shall estimate the value of a human life; who shall put a money value upon the lives of the men sacrificed, when, for a few million dollars, we might make navigation easy and safe?"

FIVE AMERICAN SUBMARINES AND MONITOR TENDER
NAVAL REVIEW, HUDSON RIVER, JUNE, 1915

Photograph by Underwood and Underwood.

The Atlantic Deeper Waterways Association

815 Crozer Building, Philadelphia, Pa.

EXTRACTS FROM CONSTITUTION

ARTICLE I.

Name.

This organization shall be known as the "Atlantic Deeper Waterways Association."

ARTICLE II.

Objects.

a. The object of this Association shall be the collection, preparation and presentation to the Congress of the United States of statistics and other information bearing upon the question of the improvement or construction of inland waterways and of the improvement of the rivers and harbors which would form an integral part of such a line of waterways from Massachusetts Bay to the Gulf of Mexico.

b. To secure from the Congress appropriations for surveys and work for the systematic improvement of such rivers and harbors and the improvement or construction of inland or interior lines of waterways communicating with the rivers, harbors, bays or sounds, to the end that eventually there shall be an efficient system of waterways permitting the free movement of traffic by water between the various States from Maine to the Gulf.

ARTICLE III.

Membership.

The membership of this Association shall consist of commercial, manufacturing and kindred organizations, district waterway improvement associations, municipal and other corporations, companies and individual citizens who may subscribe to this constitution and contribute to the support and prosecution of the objects of the Association.

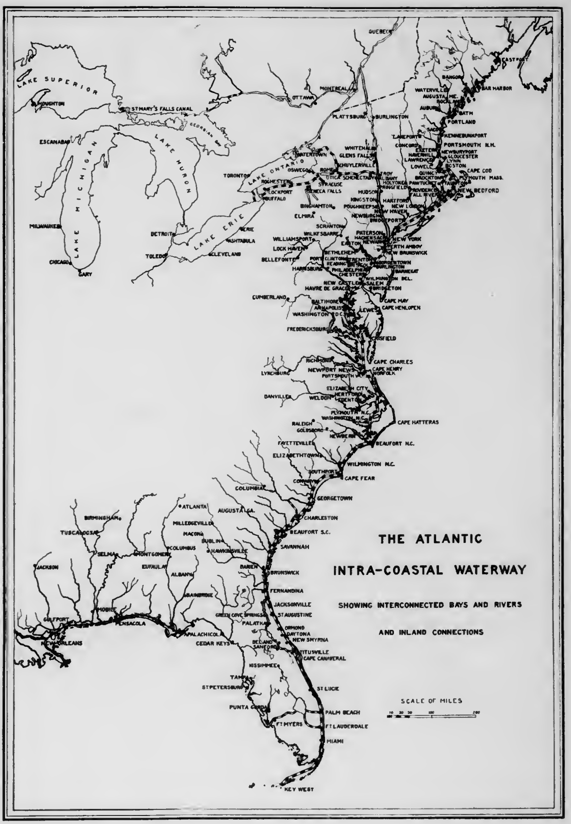
ARTICLE IX.

Dues.

Individual	$ 5	per	Annum
Firms or Corporations	10	"	"
Organizations of 250 or less	15	"	"
" " over 250 and less than 500	20	"	"
" " over 500 and less than 1,000	40	"	"
" " 1,000 and more	75	"	"
Waterway Associations	75	"	"
Municipalities of 5,000 or less	50	"	"
Municipalities of over 5,000	100	"	"

The Association desires to enlist every person, firm and organization within its territory, interested in the achievement of its plans.

If any member knows of another whose influence would help the cause, why not urge that friend to join at once?



THE ATLANTIC

INTRA-COASTAL WATERWAY

SHOWING INTERCONNECTED BAYS AND RIVERS

AND INLAND CONNECTIONS

WARE BROS. COMPANY, PHILA.

MSH 20992.

END OF
TITLE